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AVIATION

The Oldest American Aeronautical Magazine

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Wasp & Hornet ENGINES

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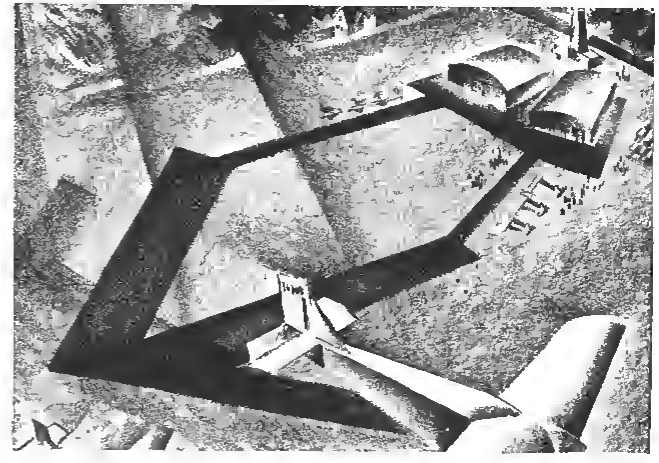
Smooth, resilient runways— *skid-safe* in any weather



AIRPORT engineers recognize their responsibility to provide safe, all-weather landing and take-off surfaces. The problem of constructing them is not so difficult, not so expensive as it may at first seem.

Aviation, the new giant, finds ready at hand the paving expertness and the country-wide service of the Barrett organization—developed in 25 busy years of paving experience.

By utilizing local materials, smooth, resilient, dustless, skid-safe, all-weather Tarvia runways—aprons and approach roads—can be built at a cost within the buying power of any airport. Easy and inexpensive maintenance will keep them top-notch indefinitely.

The Tarvia field man will gladly tell you the details. Write, 'phone or wire our nearest office.

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FOR ROAD CONSTRUCTION
REPAIR and MAINTENANCE

What are the facts about Airport Lighting?

By E. J. DAILEY
Lighting Sales Manager
Graybar Electric Company

This is Number 1 of a series of advertisements whose purpose it is to reduce the information on airport lighting to its simplest terms.

1. What is the ideally lighted field?

Above all, the field must be easily found at any time of night. After the field is found, it must be easily identified. After being identified, it must be easy and safe to land upon.

2. What are the broad general precautions?

Continuous service is of utmost importance; because the best lighted field in the world becomes far from best should the lighting service be interrupted even temporarily. (Another consideration along these lines is that the requisite apparatus be provided to earn for the field an A rating.)

3. What are the provisions for identification?

A revolving beacon mounted above all obstructions must be provided. The beam must be at least 100,000 candle-power. Further than this, distinguishing identification must be provided.

4. What indicates the boundaries?

The boundaries of a field must be distinguished by properly selected and spaced boundary lights, and the preferred approaches distinguished from the hazards. At points in the boundary where landing is not feasible, the lights must be red. Where approaches are best, the lights must be green.

5. How must obstructions be indicated?

The dangers of all obstructions on or near the airport must be indicated by red lights as in all other means of transportation.

6. What other aids are necessary?

The wind direction indicator must be illuminated to be clearly visible. There must also be a ceiling projector. The exteriors of hangars and other buildings should be floodlighted as an aid to the pilot in judging his distance.

* * *

The most important feature of airport lighting is not the type of equipment or amount of equipment but the correct application to best suit the requirements of a particular airport. Those interested in further details are invited to address their inquiries to our Airport Lighting Department. A coupon for this purpose is provided below.

Offices in 72 principal cities

GRAYBAR ELECTRIC CO.
Room 1581 Graybar Bldg.
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THE GRAYBAR TAG—SYMBOL OF DISTINCTION

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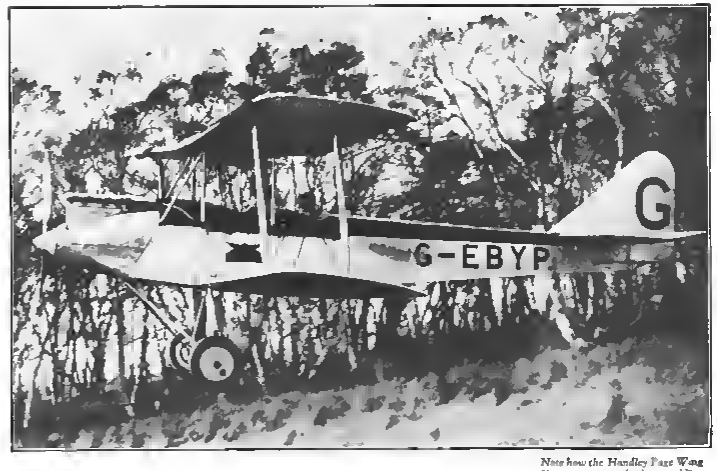

Note how the Handley Page Wing Slots are actuated thus enabling lower landing speed.

It's the Easiest Plane in the World To Set Down

By deftness of design and the perfect co-ordination of the soundest principles of aerodynamics the Whittelsey Avian gives a flying performance that no other light plane can approach. Among pilots it is recognized as the outstanding plane for training and sport. The safest to fly, the easiest to land.

In the air its stability is remarkable. And added to the safety inbred in the design of the ship are Handley Page wing slots which eliminate danger of spins and permit lower landing speed.

No plane is easier to land. And the split-axle undercarriage with its unusually wide track is sturdy, resilient and well-suited to cross-country touring when landings must often be made on rough ground.

Instruct in a Whittelsey Avian. Its economy of operation will save you money. Its inherent stability and flying qualities will hurry the solo flight.

Dealers and Distributors Are Being Appointed

When you fly or sell the Whittelsey Avian you have something to talk about. No other light plane has such a record of performance . . . or the equipment. National distribution of the Whittelsey Avian is being arranged in the leading aviation centers of the country. Dealers and distributors are being appointed. Write for further information concerning our sales plan. We will gladly send you the detailed story of the plane itself. The Whittelsey Manufacturing Company, Bridgeport, Conn. —(formerly The Whittelsey Body Company)

* * *

RECORDS IT HOLDS
First solo flight England to Australia; fastest time England to Australia, longest flight ever made in a light aeroplane; fastest time, England to India; first non-stop flight, London to Rome.

SPECIFICATIONS
Power Plant: Cirrus Hark III 95 H. P. air-cooled, four-cylinder in line aircraft engine. Top overhaul at 200 flying hours. 20 miles to gal. of gas. 500 miles to gal. of oil. — *Speed:* Maximum 102 m. p. h. cruising 85 m. p. h.; landing, 35 m. p. h. *Ceiling* 18000 feet. *Cruising Range* 5 hours or 438 miles. *Weight:* Light 575 lbs. Aerobatic 1450 lbs.; Top, 1600 lbs. *Dimensions:* Wing span 26 ft. Width folded 8½ ft. *Height Overall* 8½ ft. *Length Overall* 24 ft. *Price:* Only $1895, Flyaway at F. O. B., Bridgeport, Conn.

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THE OUTSTANDING SPORT AND TRAINING PLANE OF THE WORLD

AVIATION

The Oldest American Aeronautical Magazine

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AVIATION

THE OLDEST AMERICAN AERONAUTICAL MAGAZINE

April 13, 1929

VOLUME 6 — NUMBER 15

Investment Trusts

THE public is continuing its interest in aeronautics through the medium of the stock market. From the gum chewing stenographer to the portly bank president, every one has tried to pick the General Motors or the Radio Corporation of America. The interest has meant easy financing for small and large aeronautical concerns alike, and it is obvious that too many of them have sprung up, and that when times become hard the weak and incompetent ones will fall by the road side.

In estimating the effects that a general slump would have on the stronger concerns, the influence of the so-called investment trust must be taken into account. The bankers have found the starting of these concerns lucrative, and the public has been eager to put its money into them, but, once raised, the money was often not needed and could not be invested except for the buying of stock in aeronautical concerns at exorbitant prices. With the interest rates for cash as high as they are many of the managers of these concerns have wisely kept very large reserves of cash. When the supply of planes equals the demand, and when certain concerns that have been operating out of capital and not making a profit fall by the way side, these large reserves of cash should have a steadying influence on the value of the stronger aeronautical concerns.

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Aeronautic Progress

WHAT might be taken as a good indication of the progress of things aeronautical, is the fact that thus far one hears very little ballyhoo of "world startling" and "record smashing" flights from here to there and perhaps back again, to be made during the current year. There may be a few undertaken before next Yuletide, but in general the aeronautic world has settled down to the business of manufacturing and selling airplanes, and what is more, operating them for steady profits instead of "rainbow pots of gold."

The public received its long to be-remembered thrills, and the industry received its long-hoped-for boost, from the great flights of 1927 and 1928. Those two years will undoubtedly go down in history as the banner years in flying. However, now that the private citizen has had his eyes opened to the possibilities of the airplane, the thing upon which those aeronautical should concentrate is the conducting of their activities in a way that will continue to impress the public with the idea that the airplane is a safe, efficient and economic mode of travel.

Today, the good operation of a 100-mile airline will bring more actual dollars and cents to the aircraft industry than a car full of record-breaking coast-to-coast nonstop flights in rain, fog and snow. "Stunt" flights have, of course, their value to the game. They help to some extent in the design and construction of future planes and engines, and they often result in front-page aeronautic publicity. But they are no longer of major importance in the sale of aviation to the public. Sound development in design, consistant and safe operation and the execution of good business methods are the three main items that spell aeronautic success now and in the future.

//

An Injustice

WHEN John Doe, private citizen, runs afoul of the law he is eventually arraigned in court and given the opportunity to state his side of the case. However, though, when Joe Doe, aviator, is a party to an "air crime" it seems that judgment is passed on him before he has a chance to say anything in defence of his action. Reference is made to the recent disastrous affair that happened at the Newark Airport.

As these few lines are being written the pilot of that ill-fated tri-engined plane is still in a somewhat critical condition and quite unable to give an explanation of why he did what he did, if he did it. Yet, quite contrary to usual procedure, the local civil and aeronautical officials have issued statements in which they place the entire blame upon that poor chap's shoulders. Such premature and unquestionably unfair action is a rank injustice that causes one to wonder if the action were taken to "save other skins" at the expense of a defenceless party, whether he be guilty or not.

Aerial Photography AND THE Commercial OPERATOR

Fairchild Aerial Surveys, Inc.

A well executed view of a city is always in demand

AERIAL photography is a friend to the commercial operator. While most of us who took part in the late unpleasantness remember the many varied uses of the aerial camera, we continue to think of it as a military weapon. It is, of course, but it's also a means of making money in peace-time. Most of the individual owners who have invested in aircraft as a business seem to lose sight of this significant fact, and when an aerial photographer comes into their district looking for a plane and a pilot, no one can be found who knows his photographic "onions."

Taking pictures from the air is no longer a novel and thrilling way to make a living. Aerial photography is an established profession, and the same rules apply to it which apply to other professions. If a pilot who owns his own plane is interested in the present status of photography, and wishes to investigate its possibilities with a view to increasing his earning power, he will find that it is a serious business which demands serious effort, but one which, unlike some others, will amply repay him for the effort he puts into it.

There are several ways of looking at the proposition, because not everyone thinks of photography the same way. Some ask, "How can I sell flying time to photographers?" Others, "How can I become a good photographic pilot?" And there are those who wonder, "How can I get into aerial photography as a business?"

In the first instance, selling flying time to photographers is a good way to keep your plane in the air on profitable, conservative and dependable business a good share of the time. If a pilot can demonstrate even a fair degree of skill at getting into a good position for a photographic exposure, and can get to his objective and back without getting lost, he can develop into a reliable source of flying service to any aerial photographer who may be in need of it, and there are many, many men in this classification. I am not the only photographer who goes about the country buying flying time, and we all have one common grievance. That is, the lamentable lack of trained and reliable photographic pilots. It is not that it's such a difficult accomplishment. On the contrary, the routine of photographic procedure is not at all complicated, but strangely enough, there are not so many men available who can do it. If there were a pilot in each locality who was known to be adept at this performance, not only would the photographers' grievance disappear, but these pilots would find themselves in the air on photographic business more and more, with the logical result that they would be recognized as photo specialists and be able to devote all their time to it. It isn't a very thrilling life, but there are several things which can be said for it, among them being no noticeable inclination on the part of a photographic pilot to fly through fog, or in the rain, or through storms, or at night, or ont over very moist oceans. Also, when flying with a camera, the pilot knows where he is going and when he is coming back, and he returns to the same field from which he originally took off.

ANY PILOT who is making a success of commercial flying, has the ability to do a photographic job, provided he will take the time to familiarize himself with a few simple rules of procedure. After he has attained a fair degree of accuracy, it will become known in photographic circles that he can be depended upon to get good pictures at a minimum expenditure of time and energy, and he will find that his reputation in this direction will enable him to affiliate himself with photographers and aerial photographic firms all over the country.

The more firms of this kind he can connect himself

By ROBERT A. SMITH

with, the busier he'll be, and the growth of oblique picture sales being what it is, I should think that any independent pilot owner who is looking for more business would try to attain as wide a reputation as possible for reliability in aerial photographic work. The individuals and firms who are successful in the business of aerial photography will be enabled through him, to get a better grade of work at less effort than must be expended with a beginner, and he may conservatively depend upon them to furnish a large proportion of his revenue. They are always glad to learn of good pilots. Besides they don't file his name away in a cabinet and then forget it. They go out and fly with him and see for themselves how good he is. If he can fill the bill, he gets the flying time for any work they have.

Therefore, the best way to sell flying time to aerial photographers is to know how to fly a photographic plane. For ten years I've been flying on photographic business, and I've seen a good many pilots attempt to get their planes into position for the exposure only to be lost, largely because of their inability to read a map. It sounds silly, but at least 90 per cent of failure is attributable to this deficiency. I used to have a conference with the pilot before we took off; I would show him a map of the district with the objective spotted on it, and tell him that I wanted to take the pictures at a certain altitude. We would climb into the plane and head for the general vicinity of the objective. I could see that he was having trouble finding it, he would usually arrive there several thousand feet too high in order to locate himself better. After he had found the place many valuable minutes would be wasted while he was losing altitude, coming down to the height previously agreed upon which was necessary for the picture I was trying to get.

Fairchild Aerial Surveys, Inc.

An oblique photograph of a real estate development

Now it happens that in oblique work most pictures are of a single object—a house, a real-estate subdivision, a building, a street. If the pilot brought me in too high that house would look like a pin point, and would not satisfy the customer at all. Again, if the pilot can't read a map and comes in high in order to see better, he defeats his own purpose. If he's high he can't find the objective at all, because he can't see it.

The remedy I have developed for inability to read a map on the part of the pilot is by not telling him beforehand where we are going. I casually mention that I would like to get over a certain town at a certain height, then after we get there at that height, I can direct him by a deft movement of my hand on his shoulder and in this way get the plane into the proper position. If I miss the shot, I am entirely at fault and the pilot is not to blame. I have adopted this method because I have found that practically all pilots read maps too slowly to allow them to find a position on an oblique photographic flight quickly enough

This is a vital point, inasmuch as flying time is too costly to waste, because of a pilot's inexperience. Also, the photographer knows exactly what he wants and must get this information to the pilot in the most efficient manner. Therefore, the pilot should be able to read a map and be sure about getting to his objective without any undue

Chicago Aerial Survey Co

A fine oblique view of Baltimore, Md.

delay. If I could do this, I would be able to devote all my attention to the camera and would not have to worry about his getting lost.

Another condition which annoys an aerial photographer is the lack of understanding prevalent among pilots concerning the fundamental points to be considered in making an aerial exposure. The customer wants the picture made a certain way. He can visualize it in his own mind exactly the way he wants it. We aim to come as close to his mental picture as we possibly can. In order to do this, the photographer must consider how to get the picture on his film, how to get the chief points arranged correctly and at the same time artistically. He must make exposures from all possible angles, getting as much as he can during the few seconds he has at his disposal. The pilot is expected to assist by staying at that altitude as long as he can and by throttling down a bit so that vibration will not blur the negative at the instant of exposure. He should describe a wide circle with the objective in the center, banking a good deal in order that the photographer will not be obliged to lean clear over the side to aim his camera downward. If he can bear these points in mind while flying with the photographer, he can help materially in the excellence of the finished product and win the photographer's undying gratitude as well as all of his future flying time.

All the foregoing remarks pertain to oblique photography as contrasted with mapping, which is a highly specialized subject and not very highly recommended for experiment by untried pilots. In order to fly for a map, a pilot is required to know a good many things about mapping, and this discussion is not appropriate for even an introduction of the art. However, a pilot who has flown well for oblique work and understands the few principles outlined above sometimes is called upon to furnish the flying service for a map if his plane is capable of doing map work. It must have performance not often required in oblique work, such as a ceiling in excess of 18,000 ft., a cruising speed of over 100 m.p.h., and must be able to fly for from four to five hours with a heavy load. Mapping, moreover, is restricted to well-organized companies, and in order to sell flying time to such a company, or fly for them as a member of its organization, a pilot must have had some previous connection or association with aerial photography. If he succeeds in general oblique work and is heard of by a mapping company, he can negotiate with them as regards to flying for mapping. A mapping pilot is one of the most successful figures in the aviation industry, and one of the first ways to qualify in that direction is by succeeding at obliques.

Another outgrowth of success of success in flying for oblique pictures is that sooner or later the competent photographic flier will ask himself why he doesn't go into the business of aerial photography and pay himself for the work he does. There is really no reason why he shouldn't, provided he will regard it as a business instead of a pastime. He will discover, on entering the ranks of the profession, that the same rules apply which apply to any other business. I am no philosopher and will thoughtfully refrain from using any motto like "hard work and long hours spell success" as most philosophers are quoted as saying, but one feature should be mentioned. That is, namely, aerial photography has ceased to be a novelty, a curiosity, or even a substitute for some other form of illustration. It has been introduced and developed by the pioneers in the business and the public has been educated to appreciate excellence in an aerial photograph. Consequently, a steady demand has been created for photographs that will sell. It has been demonstrated without question that a need for good aerial photographs exists.

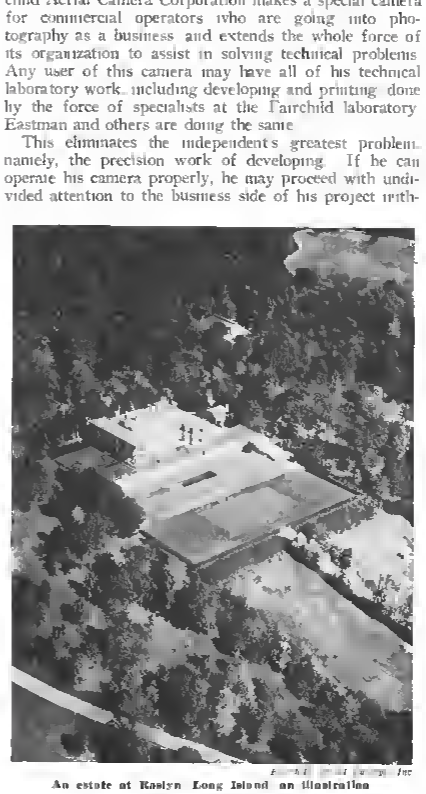
IN ORDER to supply this demand, a person engaging in aerial photography must have some equipment and experience to begin with. If he attempts to use a Graflex or a home-made camera, disappointment is swift and sure. A few years ago it was possible to build up quite a business using cameras of the above type, but since the introduction of better equipment by the larger firms, customers and prospective customers insist upon a standard of excellence impossible to obtain except in well-equipped laboratories and by the use of properly designed equipment. The same thing holds true in any other form of the aviation industry. Nobody could build and sell a three-wheel pusher type of airplane these days. In competition with a luxurious cabin monoplane the older type is hopelessly inadequate. In like manner, the photographs made a few years ago with cameras designed for a totally different purpose will not stand the test of present-day competition.

Granting that he has obtained the fundamentals of photographic technique as a photographic pilot or has learned the business by actual practice, the enterprising beginner should make a thorough study of his district with a view to seeing how he can market aerial pictures in it. The best way to see how the public reacts to oblique photography is to collect a few well-chosen samples and go out on a selling campaign. He will find that selling aerial pictures is no 'soft snap," but perfectly possible, and that he will often be required to make flights of oratory before he can make flights with his

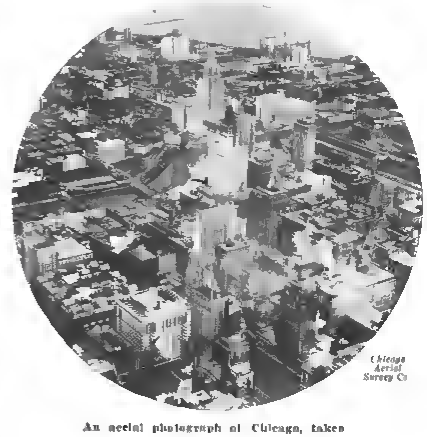
camera. It isn't a matter of price entirely, by any means, since in many cases a good deal of persuasion and demonstration will be required to convince certain potential customers that they will get as good pictures as they need. In the old days, an aerial photograph was an attraction in itself and very little effort was needed to interest the buyer in it. Today, with real estate firms and others building their entire advertising schemes around them, the fine craft paper and expensive advertising copy used in the sales promotion booklets issued by these firms are pointless and of no avail if the aerial pictures which tell the story are mediocre. The customers cannot afford to take a chance on poor work.

On the other hand, it is undoubtedly a great handicap to a beginner in the field of aerial photographic work to be expected to produce work on a par with the best laboratories in the country. If he had to build up an organization trained to handle delicate work of this kind, he would find himself in red ink suddenly and permanently. In fact, only a few beginners would survive which, if you remember, was exactly the case up to the last year or two. Now, to quote one example, the Fairchild Aerial Camera Corporation makes a special camera for commercial operators who are going into photography as a business and extends the whole force of its organization to assist in solving technical problems. Any user of this camera may have all of his technical laboratory work, including developing and printing, done by the force of specialists at the Fairchild laboratory. Eastman and others are doing the same.

This eliminates the independent's greatest problem, namely, the precision work of developing. If he can operate his camera properly, he may proceed with undivided attention to the business side of his project without the necessity of keeping a highly paid force of technicians on his pay-roll. In this case, he is able to plunge into the work of selling his pictures with no hesitation due to lack of confidence in his product.



An estate at Roslyn, Long Island, an illustration of a good commercial subject



Chicago Aerial Survey Co

An aerial photograph of Chicago, taken from the Southwest

No general remarks can be made on the subject of selling aerial photographs. It is a matter for each operator to solve his own way. As a rule, success in it is in direct proportion to the ingenuity and enthusiasm with which it is undertaken. There are thousands of ways in which oblique aerial photographs can be sold and used, which are not applicable to other types of photography, and new uses for them are being discovered every day. There is a well-established demand for good obliques which is increasing from day to day; therefore, the more effort, the more business. This is not to be construed to mean that aerial pictures can be sold on a high pressure basis, because the great majority of buyers must be satisfied that the pictures will be of some value and a means of making money or supplying needed information. The secret, then, is to point out to the potential buyer how these results may be accomplished.

Real estate concerns, of course, are among the aerial photographer's most reliable customers. They always need good photographs of new subdivisions, an estate, or rural properties of any kind. Oil producing companies use them to show their officials where new wells have been sunk, and the general appearance of new fields. City and state governments spend considerable sums on aerial photographs of traffic, street conditions, buildings, piers or roads. Aerial news pictures appear in every newspaper of prominence in the country. The list of uses is seemingly inexhaustible. It is capable of endless variations to suit local conditions and opportunities, and the volume of business is proportionate to the amount of effort expended in getting it. The dawn of the public's realization of the value of an oblique aerial photograph has already appeared, and the future holds possibilities which no enterprising independent flier can overlook. To those who provide themselves with a proper foundation of knowledge and equipment, aerial photography holds forth far reaching opportunities.

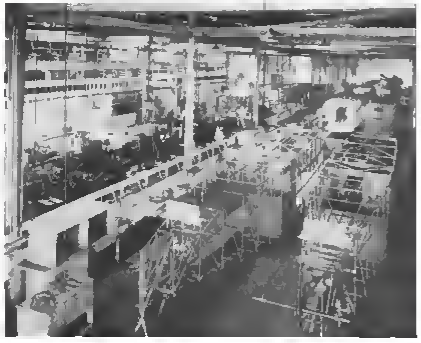
THE NEW *Fokker* UNIT AT *Wheeling*, WEST VA.

By JOHN C. LESLIE

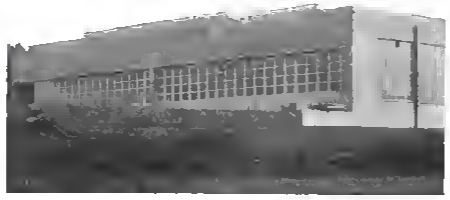
IN ORDER to keep pace with the demand for Fokker airplanes the Fokker Aircraft Corporation of America has recently put into operation the first unit of a new factory at Glendale, near Wheeling, West Virginia. Right from its inception the purpose of the design and operation of this plant has been to produce the highest quality of aircraft at the least cost by using the most modern of production methods. This purpose necessitated a concentration on one general type and therefore this factory was designed especially for the manufacture of large airplanes, it is now producing the model F-10-A with an 80-ft. wing and will later manufacture a still larger type with a 100-ft. wing. Thus the next unit of the factory will have doors and equipment for handling 150 ft. wings.

The present unit is 200x400 ft., a typical one-story steel factory building with very large window area, brick walls, and concrete floors. It is situated on the bank of the Ohio River, some 50 ft. above mean water level, with two lines of the Baltimore & Ohio Railway running past it, one track on either side of the factory. At present a siding is run in from the track on the river side; another siding will come in from the other track when the next units of the factory are built. The present receiving platform, on the river side, provides for both end and side loading of freight cars and for motor truck loading.

The building is divided laterally into two main sections, for manufacturing and final assembly respectively. The latter section is virtually a large hangar with a roof higher than the former, and with two doors opening onto a runway to the field, each 100 ft. wide. The manufacturing section, occupying about two-thirds of



Fuselage construction in Unit No. 1 of the Fokker plant at Wheeling. Note the systematic production line



the floor space, centers about a long, rectangular stockroom lying on the longitudinal axis of the factory. This provides a concentration point both for raw materials and for finished parts coming in from the nearby parts assembly sections.

The Fokker type of construction, a result of long years of experience, consists of a wing made entirely of wood, including a plywood covering, and a welded steel tube fuselage covered with fabric. This construction, proven in years of service, naturally divides the factory into two parts. On one side are the woodworking machines, the wood assembly jigs, and the wing finishing rooms; on the other side are the machine shop, the sheet metal shop, the fuselage and nacelle jigs, the fabric shop, and the covering and doping rooms. Directly on top of the storeroom, a sort of mezzanine floor, is the small parts assembly section, consisting mostly of equipment for bench welding. On a mezzanine floor over the fabric and covering shops is a large women's rest room, attractively furnished with colored furniture and curtains. A basement under the woodworking section houses a large, modern dry kiln, the main boilers, and a maintenance shop.

The success of any factory naturally depends greatly upon its organization, hence every effort was made to develop a complete but simple system. The problem was entirely one of production, since the Fokker Corporation maintains a sales force and a purchasing office in New York City, and a large engineering, experimental and service organization at its flying field, the Teterboro Airport, Hasbrouck Heights, N. J.

A Works Manager is in charge of the Glendale factory and to him the following departments report direct: Engineering Representative, Inspection, Office and Accounting, Personnel, and Maintenance. Reporting to the Works Manager through the Production Manager are the following Production Control Staff Departments: Planning and Production Control, Stores and Materials, Time-keeping, Routing and Internal Transportation, and Tools, Templates and Jigs.

In the exact center of the stockroom and hence at the very heart of the whole factory is the Production Control Center which is responsible for the scheduling and routing of all work. Work orders, materials and parts requisitions, and weekly material lists are issued from this center while time data come here for compilation.

The factory is divided into 30 Production Centers each rigged to handle specific work on the planes as they pass through the plant. The work in each Center is directed by a Foreman and under him is an Understudy Foreman to assure supervision in case of absence and to provide a supply of trained leaders as the expansion of the factory demands them.

To provide similarity for expansion a complete system for training of apprentices has been instituted. Since the Fokker Corporation recognizes the need for trained aircraft workers, its key men are all craftsmen of long experience and skill. On the other hand it is realized that the expansion of the airplane industry will require thousands of new workers and further that it will be of inestimable value to have an adequate number of these new workers trained specifically to Fokker methods and standards. It is for this reason that so much attention has been paid to proper education and advancement of apprentices through systematic classes and supervision.

A relatively large number of women are employed to excellent advantage on the following types of work: Sewing and Covering, Taping, Light Bench Welding, Rib Making, Wing Assembly and Wing Covering. With their lighter touch and more nimble fingers, it is believed that they can do such work better than men, when properly directed. The Fokker Corporation has had an unusually broad experience with women on light welding work and has found them specifically fitted for it. To give suitable attention to the training, health, and general welfare of these women a trained nurse is constantly on duty in the plant. Her office connects with the large cheerful rest and recreation room which has been furnished with attractive decorations and current reading matter.

With an outline in mind of the material and personnel involved, we can now outline the manufacturing processes, starting with the wood members. The raw lumber is brought in on freight cars and immediately stored in the dry kiln for seasoning. When ready for working it is brought up through a trap door directly to the woodworking machines to be finished to the desired shapes and sizes. Then the individual members are stored in racks over the various assembly jigs, ready for immediate use. When it is time to make one of the long laminated spar flanges the many individual members are laid out on a suitably shaped frame and glued and clamped into place. The whole process is very simple but done with extreme care. After a flange has been glued up it is placed on a rack and allowed to dry under regulated conditions of temperature and humidity. When thoroughly dried, it is put in a machining jig and by means of a high speed router guided by templates, it is shaped to its tapered form with absolute accuracy. This process, now so accurate and rapid replaces the old hand methods.

When the upper and lower flanges for one spar have been shaped they are shifted to another jig where they are clamped into their final form. Here the diaphragms and internal diagonals are put in and one plywood web glued on. Then the spar is shifted to a final jig for the attachment of the other web covering.

While the spars are being manufactured the ribs are also under way, following the typical Fokker construction of a plywood web with steam-bent cap strips on both sides. The nose cap strips are sawed out of ash and the others from spruce. The webs are shaped by means of a small high speed router guided by aluminum-backed templates. The cap strips are nailed and glued into place with the aid of a simple but accurate adjustable jig.

With the spars and ribs both fabricated, the next problem is their assembly together, and it is here that a unique

A view of the wing fabrication department in the newest plant of Fokker Aircraft Corporation

Fokker construction provides a simple solution. The ribs are made in three parts: one for the nose section, one for the section between the spars, and one for the trailing edge. This makes it possible to attach the nose sections to the front spar and the trailing edge sections to the rear spar in a vertical position, in the same jig which was used to attach the second web to the spars. Thus much room is saved and the workmen are in a more convenient position.

When these rib sections are attached the spars are transferred to the main wing assembly jig, which is made of steel and assures absolute uniformity in all the wings produced from it. In a few hours the center section ribs are put in and the bottom plywood covering nailed and glued into place. Then by an ingenious device the wing is lifted and turned over so that the top cover may be similarly attached.

Finally, the overhead trolley system, which has already transported the wing through its various stages, conveys it to the paint room where it is finished under closely controlled conditions of temperature, humidity and ventilation. Four 80-ft. wings may be accommodated in the paint shop at one time, assuring freedom from delay at this point. When the wing is painted it is conveyed to the assembly hall, where it is attached to its fuselage and the fuel and electrical connections made. The smaller wood parts such as the ailerons, cabin floors, and doors are manufactured in much the same way.

With the work on the woodworking side of the factory outlined, an outline may be given of the manufacture of the metal parts of a Fokker airplane. The welded steel tube fuselage requires that the individual tubes be shaped so as to fit snugly together at the joints. This is done on milling machines with angles and distances

A "Wasp" powered Fokker Super-Universal, which has been fitted with "Stinsonite" equipment

accurate within the usual close limits of fine machine tools. The finished tubes are checked against master tubes so that their fit is assured and the old methods of hand fitting eliminated. The other equipment of the machine shop, such as lathes, shapers, drill presses, and rubbing machines is used for making special fittings, bolts, and production tools.

Next in line to the machine shop come the jigs for the welding up of fuselage, nacelles, nose section, and main bulkhead. These jigs are all made from rolled steel sections and will turn out finished work accurate within close limits, with a minimum of final adjustment. To avoid the carting of oxygen and acetylene tanks through the factory for welding, the gases are piped from common sources; each outlet has its own valve and gages so that the welder can suit his gas supply to his needs. With fifteen years of experience behind it, the Fokker organization can turn out work of this kind very accurately and rapidly.

The sheet metal work, including cowling, tanks, control horns, cabin seats and a multitude of similar items, is manufactured in the well-equipped shop mentioned. Many of these parts are actually assembled, however, in the small parts assembly section on the mezzanine floor over the stockroom.

When the fuselage leaves its assembly jig it is mounted on a wheeled carriage and enters the assembly line, in the course of which it passes by a number of work benches and stock racks for the installation of the many component parts; these include tailskid, woodwork, wiring, controls, and instrument boards. The assignment of work for each station depends mostly on being able to separate the men working on the plane so that they will not interfere with one another. By the time the fuselage reaches the end of the building it is ready to receive its fabric cover. In the meantime, therefore, the fabric shop has sewed together the various covers and delivered them to the covering department. The bare fuselage passes into the inclosed covering room where these covers and the upholstery are applied under proper humidity and temperature conditions. Thence it passes into the fireproof and thoroughly ventilated dope shop where it is doped and painted.

Now the plane is ready for final assembly and so passes into the assembly hall where outboard nacelles, control surfaces, landing gear, engines, and cowling are attached. In a brief time it is a completed airplane ready for its test flight. It is wheeled out through the big 100 ft. doors and down a graded earth runway to one end of the flying field.

The field is about 4,000 ft. long and 200 yd. wide, with a fine sod surface. It is entirely suitable to the testing of large airplanes, and what is more is an important addition to the small list of good fields in the mountain district. Situated as it is half-way between Washington and Dayton, exactly on the through route, it will probably frequently be used by cross-country fliers, and the Fokker Corporation will be glad to accommodate visitors. For its own use the Corporation plans to build a hangar at one end of the field for storage and servicing.

The present factory is, of course, only a presage of what will some day be seen at Glendale. The ample room available for expansion will undoubtedly soon be used to help satisfy the demand for Fokker airplanes. The Corporation owns 800 ft. more along the railroad which will probably be used for a factory for even larger airplanes than the present F-10. Such a plant would have doors of 150 ft. clear span to accommodate the largest wings now planned. At the other end of the factory will be an Administration Building to house the office force and to provide comforts and conveniences for employees. The total building program at this time calls for 200,000 square feet of floor space at Glendale.

This program is only part of that planned for the Fokker Aircraft Corporation of America. At Hasbrouck Heights, N. J., on the Teterboro Airport, is its original factory which will be continued as a service and experimental station. In Passaic, N. J., two floors of a large mill building are used for wing and fuselage construction chiefly for the smaller planes. In the near future there will probably be a large factory in California. The management of the Fokker Corporation is keenly aware of the reputation that many years of fine design and manufacture have earned for it. Its guiding purpose is to assure not only the continuance but also the enhancement of that reputation.

THE BOWLUS *Sailplane*

By WILLIAM H. BOWLUS
Chief Technical Training Division
San Diego Air Service Corp.

UNIVERSAL interest has not yet been attracted to gliders as they have not yet captured the public imagination. This is especially true in the United States. The American people have wanted power linked with their speed and have demanded fast travel.

Aviation has passed through the stage of novelty, however, and has definitely entered the fields of business and pleasure. There is much pleasure to be derived from soaring in a glider and the technique of operation can be mastered in a remarkably short time.

American aviation thought to date has been applied to airplanes, and such few gliders as have been produced in this country have been virtual copies of German gliders.

My own interest in gliding dates back to 1914 when I constructed my first glider. It was a crude predecessor of the present graceful machines, yet it served its purpose as whetting my interest in gliding and helping to teach me what not to do in construction of gliders. Since then I have built fifteen gliders, the most recent of which is a sailplane that I shall describe. It is not a true glider.

Left, I. N. Lawson, Jr., president of San Diego Air Service. Right, William H. Bowlus

The distinction between a glider and a sailplane should be stated. A glider, generally speaking, only glides downward, yet a fairly good operator can keep a good glider up a long while. A sailplane on the other hand can be kept in the air indefinitely. It differs from a glider largely in cleanness of design looking toward presentation of less air resistance.

To date within my knowledge there have been no real sailplanes built in the United States. Such sailplanes as have appeared have been brought from Germany. Germans were early interested in gliders and they have moved on toward a general interest in sailplanes.

In designing this plane the three things borne in mind, in the order of their importance, were first, good aerodynamic characteristics; second, structural strength and ruggedness; and third, simplicity and ease of construction.

In order to obtain good aerodynamics the drag was reduced to a minimum by streamlining wherever possible, and for this same reason the full cantilever type of construction was adopted.

In order to have a plane of practical value it was believed that it should be sufficiently rugged to stand considerable handling without the necessity of continually making minor repairs.

The structural design was kept as simple as possible consistent with good performance and metal fittings especially were avoided. Wood members were used for bracing wherever possible.

The plane is a high wing, full cantilever monoplane using tapered wings. The fuselage is of rectangular cross section tapering to a horizontal wedge in front and in the rear to a rectangular section about 6 in. vertical by 10 in. horizontal. The wings are made up in three parts, a center section of six foot span being built integral with the fuselage and the two wings of 19 ft. lengths bolted in this center section, access to the mounting bolts being had through hand holes in the fabric. This allows the wings to be dismounted for transportation.

The fuselage has a maximum section at the pilot's seat of 24 in. deep by 19 in. wide and is constructed of four spruce longerons 3/4 in. by 3/4 in. at the pilot's seat, and tapering to 3/8 in. by 3/8 in. at the tail plate and to 1/4 in. by 1/4 in. at the nose. Strut members of the fuselage are also of spruce and have a cross section the same as that of the longerons at the station where they are installed. Diagonal bracing is taken care of by the use of thin spruce strips one and one-half inches wide by one-sixteenth thick, designed for a tensile load of ap-

proximately 500 lb. These strips are moistened and then glued and nailed in position with their center line intersecting the joint of the longeron and the strut. When these strips dry out they shrink slightly and give the entire structure rigidity without subjecting members to any great initial stress. On each side a fairing strip 1/4x3/8 in. is placed on edge for the purpose of holding the cloth away from the sides of the fuselage and slightly improving the appearance. The forward portion of the fuselage, from the nose to the trailing edge of the wing, has a V-bottom and carries a skid for landing.

IMMEDIATELY behind the pilot's seat there is a bulkhead of $\frac{3}{4}$-in. plywood which extends from the keel to the top chord of the front wing spar and at the rear wing spar there is a similar bulkhead. These two bulkheads transmit the load of fuselage and pilot to the wings in flying, and to the skid on landing. These bulkheads have an hour glass shape, being the full width of the fuselage where they attach to the longerons and above that, narrowing to approximately the width of the pilot's head and again flaring out for their attachment to the wing spars. Above the fuselage these bulkheads are boxed in forming a streamlining for the pilot's head. The center section, which is attached to the bulkheads is six feet long and has a chord of 5 ft. 6 in. It is permanently attached to these bulkheads. At the rear of the fuselage a short stub vertical fin is built, to which the rudder is attached. A light tail skid of conventional type, with rubber shock cord, is built in about a foot from the end of the fuselage, an inspection hole being provided by the use of hookless fasteners.

Controls are of the conventional type using a stick and rudder pedals, operating the control surfaces by means of 1/16 in. control wire.

The wings are of full cantilever construction, tapered in plan form using U.S.A. 35-A airfoil section. This section gives high lift and at the same time is well suited to cantilever construction because of its deep section, the spars having a depth at the root of 10.95 in. and 9.13 in. respectively. The wings proper are 19 ft. long and have a chord of 5 ft. 6 in. at the root, tapering to 32 in. at the tip, and are bolted to the center section by duralumin fish plates.

The spars are built up Pratt trusses. The top and bottom chords are made up of two strips of square spruce glued and nailed on each side of the vertical and diagonal members, the diagonal members, of course, being placed so as to be in tension under flying load. The top chord of the spars is kept horizontal, the lower one slanting up thereby giving a slight dihedral to the lower surface of the wing. The front spar is set at right angles to the center line of the fuselage, the rear one slanting forward in order to keep it as deep as practical, the taper in plan form being obtained mostly by slanting the trailing edge forward.

The ribs are made by cutting a web of craft paper and gluing on each side of this cap strips 1/8x1/16 in., nailed occasionally to hold them while the glue is drying. These ribs are found to be exceptionally light and very easy to construct and are many times stronger than necessary for glider loading. Every third rib is made a compression rib by placing spruce compression members on each side of the web. The wings are braced diagonally in the same manner as is the fuselage, with thin spruce strips. The leading edge back as far as the front spar is covered with thin plywood to give a true airfoil section and to add rigidity. A wire is used for the trailing edge. These wings prove to be extremely strong and rigid, very little flexing being noticed even in flight. In fact the entire glider has been lifted by the wing tips.

The ailerons are 10 ft. long and have a box beam at their leading edge which is hinged at the top to the rear spar and are pulled up by the control cable and down by a spring, the greatest motion being upwards.

The rudder is a balanced, full cantilever type of rather thick section, the entire load being taken by a box spar placed one-third of the chord from the leading edge. The balancing fin is entirely cut away at the lower portion where the rudder is hinged to the stub fin. The ribs of both the rudder and the elevator are constructed with paper webs the same as the wing ribs. The rudder is approximately five ft. high and has a 33 in. maximum chord tapering to a rounded top.

No fixed horizontal stabilizer is provided. The elevator is balanced and of the same section as the rudder and the same ribs were used, in other words, the stabilizer is equivalent to two rudders placed end to end. The depth of the stabilizer at its center section is approximately the depth of the fuselage and continues the general streamline effect. Both the rudder and the stabilizer are attached to a 3/32 in. duralumin end plate which has ears bent out to form the hinges. This plate is securely attached to the longerons by means of ears.

A LANDING GEAR is used for experimental flights and towing on level ground. This prevents damage to the wing tips and makes it possible to tow the glider on the highway if necessary. When soaring flights are to be made it is easily removed and the landings made on the keel skid provided for that purpose. The landing gear is made entirely of duralumin tubing and the vertical struts which extend from the wheels to the upper portion of the plywood bulkhead directly behind the pilot cockpit contain a compression spring for absorbing shock. Straight side tires, 10x3 in. originally intended for airplane tail wheels, were obtained and wheels made up for them by turning a wood disk and gluing and screwing plywood plates on each side to hold the tire on. A bearing was provided by driving in a short section of steel tubing and riveting it in place. At the front end of the fuselage a quick release is installed.

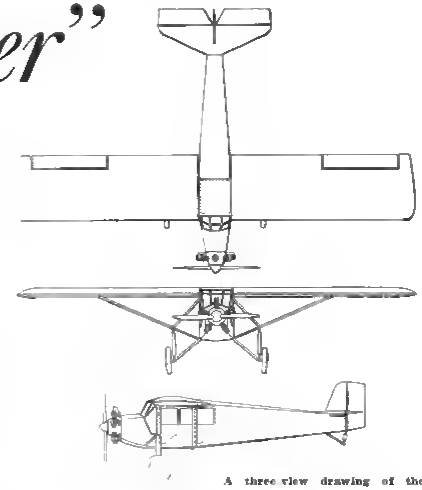
Wing, fuselage and tail surfaces were covered with No. 100 cambric. This material is very light and takes dope well. Three coats of dope were applied, the last one having aluminum pigment.

As far as can be ascertained the performance of the plane with a gross weight of 305 lb., was take-off at 22 m.p.h. and a gliding ratio of approximately 20-1.

Specifications of the Bowlus Sailplane

Span	44 ft.
Chord at root	5 ft. 6 in.
Chord at tip	32 in.
Over-all length	25 ft.
Weight empty	160 lb.
Weight empty with landing gear	180 lb.
Aspect ratio (approximately)	11 lb.
Wing curve	U.S.A. 35-A
Wing area	179 sq. ft.
Rudder weight	3 lb.
Elevator weight	7 lb.

THE "Courier" MONOPLANE



A three view drawing of the "Courier," three passenger cabin monoplane

THE "Courier" monoplane designed by William J. Waterhouse, and now being placed in production by the Courier Monoplane Co., was first flown by Jack Rand, on February 12 from Mines Field, Los Angeles, Calif. The initial test flight was a complete success and before descending, Rand put the plane through a series of maneuvers. Later flights with varying loads have shown remarkable stability and excellent control even at stalling speeds. Use of the Frise type slotted ailerons has given the plane unusually good lateral control.

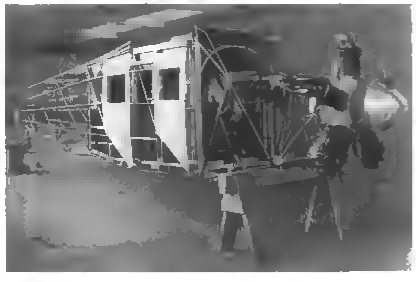
The Courier is a three place cabin monoplane of high wing, externally braced type, and is powered with a Kinner K-5, 100 hp. engine. The span is 37 ft., height 7 ft. 8 in., and length 24 ft. 6 in. The weight empty is 1355 lb., normal pay load is 400 lb., and the gross weight loaded is 2100 lb. With full load the plane has demonstrated a top speed of 110 m.p.h. at 1850 r.p.m., cruising speed of 90 m.p.h. at 1650 r.p.m., and a landing speed of 38 m.p.h. Take-off and landing run without brakes and in still air is under 200 ft., initial climb is approximately 750 ft. per min., and the service ceiling is set at 12,000 ft. although in one test with pilot only the plane climbed to 16,800 ft. in 80 min. The all around performance of this plane with a 100 hp. engine is believed to be exceptionally good and indicates the increasing popularity which this type may be expected to enjoy in the aircraft market.

Many features of advanced design have been incorporated in the construction and equipment of the Courier. Exhaust manifolding, stick control, stabilizer control, tail skid, and cabin upholstery are all of new type. Although the fuselage trussing is rugged, the plane having a factor of safety everywhere in excess of Department of Commerce requirements, provision has been made for two large doors, ample window space, and a cabin that is entirely free of structural obstructions. The first "Courier" has been finished with white wings and tail surfaces, and red fuselage and struts. Production is now being started in the Long Beach factory formerly occupied by the International Aircraft Corp. and as soon as an approved type certificate is granted by the Department of Commerce, it is planned to turn this craft out at the rate of two a week. Jigs, dies, and tools are now being prepared for this production and if the demand should require a greater production than two a week, which is the capacity of the present plant, it is planned to erect a modern aircraft factory on one of the Southern California airports.

The Courier wing is of conventional wood and fabric type and is built in two panels which are hinged to a cabin center section. Spars are of box type with three

A front quarter view of the Kinner powered, "Courier" monoplane, showing the clean nose cowling and the cowled exhaust ring

ply side plates and spruce cap strips and spacers Three bays of single wire drag bracing are employed in each panel, compression struts being of simple steel tube type and five heavy ribs being used to take the torque strains between spars Ribs are spruce and plywood in Warren

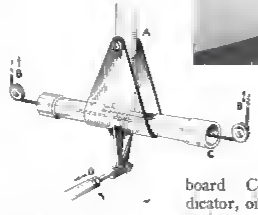


Fuselage airframe of a "Courier" monoplane before covering

truss structure and are spaced at distances varying from 12 in at the root to 14½ in at the tip Plywood covering on top and bottom of the leading edge to the rear edge of the front spar preserves the true wing curve, the Gottingen 398 airfoil section being used Light steel tubing is employed along the trailing edge of the wing, and the wing tip also is faired with steel tubing, but of heavier gauge

Frise type ailerons, set in approximately 12 in from the wing tip, are mounted to a false spar by three pin hinges on steel tube brackets The airfoil curve of the aileron is maintained by an aluminum sheeting over the entire leading edge of the aileron, thus retaining the excellent qualities afforded by this type of control

The fuselage is of welded, chrome molybdenum steel tubing in Warren truss structure, with heavily stressed members doubled and an arch construction being used over the ceiling of the cabin for bracing purposes and also to distribute more evenly the landing loads from the landing gear struts All tubing is protected against weather inside and out Both wings and fuselage are covered with airplane fabric which is liberally doped and finished with Brohte lacquer Wing panels are pin hinged to fittings on the uppec longerons and are braced to the lower longerons by parallel steel tube struts streamlined with balsa wood and fabric covered These struts are adjustable at the wing spar fitting as a provision for rigging Cabin streamlining is of light spruce strips and is neat and efficient Later fairing is to be accomplished by the use of dural strips



Two wide doors give easy access to either the pilot's or the passenger's seat in the cabin. Passengers sitting side by side in the rear have very good vision and an unusual degree of leg room The cabin framing is of spruce members clamped to the steel fuselage structure The floor is of carpeted plywood, but the ceiling instrument board, and all wall space have been finished in mottled brown Micarta panels manufactured by the Westinghouse company These panels are screwed to the spruce framing and joints are covered by ornamental molding. Aluminum is used for finishing around doors and windows The result is exceedingly pleasing, the Micarta having much the same effect as the natural wood panels which are being so much used In addition it is possible to wash Micarta and keep it always bright and clean, it does not easily scratch or mar, is almost completely fireproof, and has a very considerable muffling affect so that the cabin is exceptionally quiet A dome light is provided in the cabin ceiling and windows are of the sliding type to provide ventilation A luggage compartment capable of taking three full sized suit cases is reached by lowering the hinged seat back of the passenger seat Both pilot and passenger seats are luxuriously upholstered and the entire interior effect of the cabin is rich and pleasing Sedan type aluminum doors are standard

The pilot's seat is set well forward and several inches higher than the passenger seat, for visibility From a normal sitting position the pilot can see the ground 50 ft straight ahead of the plane when in landing position and can also see his landing gear at all times A Consolidated type "A" panel is used for the instruments which are all of Consolidated manufacture, but it is said that on all future planes the flying instruments will be on the left and engine instruments on the right of the

The cabin of the three passenger "Courier," showing the interior which is finished in sheet micarta. Left The Waterhouse control, standard on the "Courier"

board Consolidated compass, tachometer, air speed indicator, oil temp indicator, oil pressure gauge, and bank indicator are standard equipment; as are also dome, instrument board, and navigation lights

All control wires and tubes are concealed between the fuselage fairing and cabin walls or floor. Rudder bar control is of ordinary type but the stick control is an original development of William J Waterhouse and is of a simple, compact type which permits only the stick itself to project through the cabin floor A large transverse shaft is mounted on hollow bearings below the floor The stick itself is pivoted in a box mounted on

this shaft, in such a way that the lower end of the stick may operate the aileron control wires which pass out through the hollow shaft and over Micarta pulleys to a lever fitting on the front spar from which the aileron is actuated by a push and pull tube, an aileron balance cable running across within the wing completing the linkage in customary fashion Elevator control is by means of a push and pull tube connected to a horn on the box within which the stick is laterally pivoted This tube continues beneath the cabin floor to a balanced cable fitting in rear of the cabin, from which the movement is carried to a second lever in the tail, there actuating a pair of push and pull levers to horns on the individual flippers The entire control system is easily inspected All control wires are of ⅛ in cable Rapid adjustment of the horizontal stabilizer is made through a worm gear fitting on the tail post operated by a torque tube from a small aluminum wheel at the pilot's left and carried along the fuselage by universal joints and plain bearings

Right Officials of the company standing in front of one of the "Courier" planes, T. J. Bailey president is at the extreme left

Left The tripod tail skid on the first "Courier" monoplane

A QUICKLY DETACHABLE engine mounting is used in order that the Kinner engine may be readily dismounted or another engine of like power may be fitted if desired The Kinner K-5 has proved of ample power and is quiet and vibration free in operation in this plane Exhaust manifold cowling gives the nose an excellent streamline The manifold is built in between the engine crankcase and the propeller spinner, final exhaust being through a single stack extending below the cabin The built-in exhaust is unusually large, and is air cooled by means of a scoop and internal passage, air being circulated by the propeller This method of manifolding has provided excellent cooling and also serves as an effective muffler Story wood propellers are to be standard equipment on all Courier planes

Cowling around the nose and engine is of aluminum back to the forward edge of the main cabin A heavy aluminum firewall is also built into the forward part of the cabin The oil tank is of five gal. capacity, located in the fuselage ahead of the firewall A single 32 gal gasoline tank is mounted in the center section above the cabin It is of terne plate steel sheeting built to a true wing curve and is quickly removable from the top All fuel lines are of copper tubing The joints are flexible

The tail members are all of chrome molybdenum steel tube construction The fin is of cantilever construction and pivots on a heavy tube which extends down into the tail post Adjustment may be made on the ground only by means of a lock nut and bolt fitting which attaches the leading edge of the fin to the fuselage The horizontal stabilizer is built in one unit of semi-cantilever type and is hinged at the leading edge to fittings on each upper longeron A tube extending down through the worm gear adjustment carries the rear spar of the stabilizer on its upper end and two brace struts on the lower end, each of which extends out to the rear spar The rudder is mounted by three pin hinges, two on the tail post and one on the vertical fin, while each individual elevator is mounted to the stabilizer by three pin hinges

A conventional split axle landing gear is fitted struts being of round steel tubing streamlined with balsa wood and fabric covered Landing shocks are carried by Gruss shock struts Goodyear 30 by 5 in wheels are carried on Johnson disk wheels fitted with Johnson brakes Brakes are individual and are operated by pedals independent of the rudder bar but operable without removing the feet from the bar when it is in an approximately normal position

The tail skid on the first "Courier" is of tripod structure with landing shocks taken by a column of rubber disks in compression Due to the popularity of tail wheels, however, it has been decided to equip all future Couriers with a steerable wheel behind the tail post.

The Courier Monoplane Co is now prepared to initiate a very material production program and while anticipating early granting of an approved type certificate, for which application has been made, work is being rushed on tooling up the Long Beach factory for production

Specifications and performance figures as supplied to AVIATION by the manufacturer are as follows:

Length overall	24 ft 6 in
Height	7 ft 8 in
Span	37 ft
Chord	6 ft.
Airfoil section	Gottingen 398
Angle of incidence	0 deg
Dihedral angle	0 deg
Weight empty	1355 lb
Normal pay load	400 lb
Disposable load	746 lb
Gross weight loaded	2100 lb
Wing loading	9.46 lb. per sq. ft
Power loading	21 lb. per hp
Power plant	100 hp at 1850 r.p.m
Top speed	110 m.p.h. at 1850 r.p.m.
Cruising speed	90 m.p.h. at 1650 r.p.m
Landing speed (still air)	38 m.p.h
Initial climb	750 ft. per min
Service ceiling	12,000 ft

BOOSTING *Airline Passenger* BUSINESS

By HAL SHIELDS
General Passenger Agent, Western Air Express

IT IS well known that commercial aviation in the United States has been built up principally by the carrying of mail and express. In 1928, airplanes in this service flew 7,500,000 miles, carrying a total of 137,000,000 letters and some 30,000 express packages, and this volume of air mail and express traffic will undoubtedly increase in years to come, serving to provide a substantial part of the profits from airline operation. However, the air passenger must not be ignored, because he is going to be the greatest friend of the air transport operator in the future. It is fitting, therefore, that we should consider what we have done for the passenger and what more we may do.

The development of the passenger airplane has followed much the same trend as that pursued by other transport vehicles, except that improvement in the plane has been much more rapid. The early passenger trains, steamers and automobiles were extremely crude and uncomfortable. Gradually, as years passed by, they became luxurious. The early airplanes were also crude and uncomfortable, and they remained that way until only a few years ago, but since their worth as passenger conveyances has been recognized, the improvement has exceeded anything of the kind ever before known to the transport world. Today the large passenger plane is a luxurious conveyance. It rivals the finest Pullman car, and it is being improved every day.

My most intimate knowledge of air transport naturally concerns the operations of Western Air Express, but I know that just as our company has improved its accommodations for passengers, so have other leading transport concerns, while still others are arranging to do so. All of us at the start used open cockpit planes as they were all we could obtain. Now most of us are using cabin planes, with from one to three engines and seating from four to twenty people, and the time has arrived when the air passenger demands the comfort of a cabin.

The development of the passenger plane has been rapid and constant improvements are being made. This can be illustrated by our own experience. In May, 1928, Western Air Express accepted delivery of three tri-engined Fokker F-10's, and they were described then as the fastest and most luxurious passenger airplanes in America. Since the first of this year our company has received delivery of seven more of these Fokkers. They look much the same as the others, but the new specifications provide for more than 200 refinements. It can be presumed that within another year there will be many more refinements, for we recognize that airplane construction is far from being standardized.

A study of these refinements shows careful consideration for the comfort of the passenger. The tilt of the chairs has been changed slightly so that the passenger rides more easily, and the upholstery has been made a little thicker. The windows have been enlarged so as to afford a better view. Two additional ceiling lamps have been installed so as to get better illumination for night flying. The vacuum bottle providing ice cold water for drinking purposes has been replaced by a more ornate container. The small silver plated ash tray for the convenience of smokers has been discarded, and in its stead there is a three part contrivance giving room for matches, ashes and cigarettes, with a small removable mirror behind it.

Formerly, the cabin floor was covered with battleship linoleum. Now a rug tops the linoleum. In the front of the cabin there have been installed instruments by which the passengers may observe the speed and altitude. The baggage compartment has been more compactly inclosed, and a cabin has been installed for the carrying of foodstuffs, dishes and cutlery. The toilet has been made larger, and provision also has been made for hot and cold running water.

These are a few of the improvements that have been made in the large planes for the convenience of passengers. Everything that the Pullman car offers has been provided, and even more. The Pullman does not provide individual mirrors and individual ash trays, the Pullman chairs are not as comfortable, and there is nothing in the Pullman to tell the passenger of the speed that is being made.

There is also the human courtesy side of dealing with passengers and here again I believe our air transport companies have gone our friends, the railroads one better. It has been policy for us to do so. We have studied closely all the railroads have done, and we have tried to improve upon their methods. I know Western Air Express has done this, and I am confident that all the larger air transport companies have done the same.

Passengers disembarking from a Western Air Express plane at the end of the walk leading to the station

WE HAVE sought, in fact, to give our patrons more than they expect. Our agents inform prospective passengers that the company bus will leave the office at a certain hour to transport them to the airport. They expect to make the trip in a bus. Instead, they are conveyed to the airport in expensive limousines driven by uniformed drivers.

The passenger is driven direct to the station in the airport. This depot is of Spanish type architecture. It is not large, but it is attractive. There is a general waiting room, a special waiting room for women, a ticket office, suitable lavatory space and a roof garden. On cold days a roaring blaze in the fireplace gives its welcome. The automobile drives the passenger direct to the door of the station. If the passenger goes to the airport in his own automobile he may store it in one of the hangars without charge.

The airplane is brought to a position directly in front of the depot on the field side. Extending from the depot there is a canopied walk built in telescope style so that it may be extended to inclose the door of the airplane.

Crowds at Curtis Field inspecting some of the Tri-engined Fokker monoplanes comprising the Western Air Express fleet

cabin This permits the passenger to walk directly from the waiting room to the interior of the cabin without being exposed to the elements He is always under cover It also prevents anyone from walking onto the field and getting too near the propellers

No passenger is expected to carry his own baggage We have uniformed attendants to attend to this, and tipping, by the way, is not permitted on the passenger planes The courtesy element is also continued after the flight has commenced. When the airplane has straightened out on its course the second pilot passes out daily newspapers to the passengers Both pilots are in uniform. Writing paper and envelopes are available for those who desire to write letters, and a handsome log book describing the flight is given to each passenger As points of interest are reached, they are called to the attention of the passengers And then there comes the serving of lunch, an experience that always appeals strongly to the person making his first air trip

In our selling talks to prospective passengers we never say anything about the serving of luncheon on the flight Of course, the old timers know all about it, but to the newcomer it is a surprise, just another one of those things we are doing to please our passengers When we first established the de luxe line between Los Angeles and San Francisco with the co-operation of the Daniel Guggenheim Fund for the Promotion of Aeronautics, the luncheon was served in boxes and the coffee was served in paper cups Now the food is served on a beautiful lacquered tray, and the coffee is served in silver goblets with removable paper lining

THE Los Angeles and San Francisco trip takes only three hours The passenger leaves one terminal at 8 50 a.m. and arrives at the other terminal at 11 50 a m , or before It could be argued that under these circumstances the serving of luncheon is not necessary, that it constitutes a useless expense to the operating company However, we have found that it pleases the passengers They are sufficiently hungry to eat the dainty luncheon that is put before them, and we have found that the provision of this service has paid us many times over in the way of good will At the end of the journey, the passengers are again met by uniformed attendants and are taken in limousines to the company office, or to their hotels if centrally located

I have described here what Western Air Express does in the way of handling passengers It can be said that the same courtesy is extended to passengers by all the other large air transport companies We all have worked in close harmony, and we have exchanged ideas freely so that the whole cause of air transport may benefit

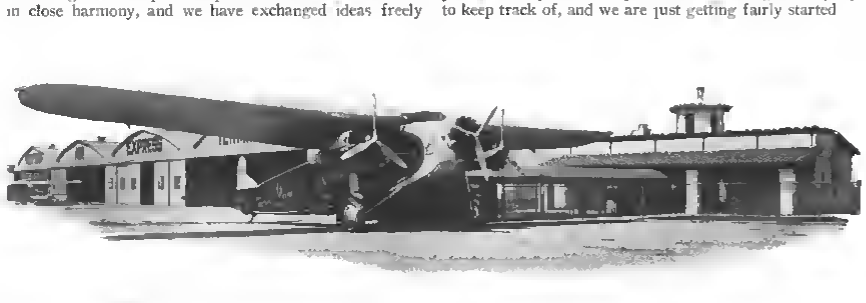
If we glance back over the list of personal courtesies being extended to air passengers we will realize we have been doing more in this respect than the railroad operators Free newspapers, free transportation to and from the airport, free luncheons, the pointing out of

Flight picture of one of the Pratt & Whitney powered, Fokker transports used by Western Air Express

points of interest, and no tipping are a few of the things we have added to that we have learned from the older transportation systems, and all have tended to make air travel more popular

On some airplanes now in use in the United States, there have been installed electrical kitchens and electrical refrigerators In others, designed chiefly for personal use, the number of chairs has been reduced to make room for a lounge or a desk In the near future we will have airplanes that will be even more luxurious All of us have made extensive experiments with radio from plane to field, but this has been chiefly for our own operating purposes The sending of commercial messages from an airplane for the private individual has been opposed by the established telegraph companies and such a service is not now permitted However, this will come when the use of the radio telephone in airplanes becomes practical This service can be expected to be of great value to many of our passengers

Probably no one would be brave enough to attempt to predict just what further improvements in air passenger transport service will be made within the next year five years or 25 years They have been coming too rapidly to keep track of, and we are just getting fairly started



W. A. E. Fokker at the landing point in front of the passenger station at the Los Angeles terminal

REGARDING THE MATTER OF *Load Factors*

By C. L. OFENSTEIN
Aeronautical Engineer

BECAUSE there has been considerable discussion and misunderstanding regarding load factors, it is believed that an article of explanation is needed at the present time.

A load factor consists of two parts, a factor of safety and the expected load A factor of safety of two is universally used. This factor of two is considerably overworked, because in it are included the following factors:

(1) Probability that some of the materials used in the construction of the airplane are not in accordance with the specifications used in the design

(2) Poor workmanship consisting of poor welds, parts not fitted accurately members particularly wing beams, being routed to a greater depth than called for in the design, etc

(3) Deterioration in service: Many planes spend considerable time out in all sorts of bad weather, resulting in loss of strength of fabric and of some structural members due to corrosion and in some cases to decay Some planes are put through severe stunting with light loads and suffer seriously in having members stressed beyond the elastic limit

(4) Factor of ignorance which takes into account the lack of knowledge of the loads actually imposed on aircraft under various conditions

An examination of these four items indicates that the factor of safety of two is none too large.

The loads to be expected have been selected from experiments made by the U S Army Air Corps and by the National Advisory Committee for Aeronautics Several years ago an Army aviator made a number of experimental flights in an airplane in which an accelerometer was installed This instrument gives readings which indicate the magnitudes of the loads to which the wings of the airplane are subjected In the various maneuvers which the airplane was put through it was found that the worst load came in pulling out of a fast dive sharply. In this case a load equal to about eight times the weight of the airplane was put on the wings Barrel rolls were next in severity amounting to about seven Very severe bumps encountered as a result of passing through storms, or over certain kinds of terrain gave loads of a little more than three A short time ago an experimental pilot at Langley Field actually obtained a load of a little over eleven on the wings of his plane in pulling sharply out of a steep dive at very high speed As a result of the Army tests, the Navy and Army Air services decided that while the pilot making the experimental flights obtained a load on the wings of about eight times the weight of the airplane, the average pilot in executing his required maneuvers would not put a load of more than six on the wings. Multiplying this load of six by the safety factor of two gives the load factor of twelve which is used in the design of pursuit planes for the Army and Navy

Training planes for the Army and Navy are designed on load factors of eight and seven and a half respectively, because it is considered that these planes will not be subject to such severe loads as the pursuit planes A load of a little over five has actually been recorded in pulling out of a dive sharply in an Army training plane

IN DECIDING on the load factors to be used on the wings of commercial airplanes the Department of Commerce considered that since the purpose of these planes is to carry persons or property from one place to another without any maneuvers or stunts which would throw severe loads on the structure, the design load should be based on the loads induced as a result of encountering severe bumps Estimating the load caused by such bumps as three and a quarter, a basic load factor of six and a half was selected for planes weighing up to 2,500 lb and powered with the OX-5 engine Since most commercial planes in service today have this power plant, six and a half is the design load factor for the average commercial plane It is believed that this low load factor may explain the frequency with which planes are losing their wings in the air during recovery from a dive. Nearly every week we see an account of some commercial plane folding its wings in the air, crashing and killing two or three people. When we analyze the conditions and realize that in pulling out of the dive the pilot may have put five or six times the weight of the airplane on the wings which were designed on the basic load of three and a quarter The average pilot has no idea of the limitations of his craft, he does not know that it is not designed to withstand the loads induced by pulling out of a dive; or that it is a very serious mistake to stunt his plane by himself and then carry passengers The attention of all pilots should be drawn to these facts in order that they may exercise proper judgment in their flying It may be possible that there should be a special class of commercial planes called training planes designed on higher load factors than the ordinary planes, or else possibly the raising of the entire set of load factors for all commercial airplane design.

Second Annual Detroit Show Most Representative Yet Held

Record Number of Craft With New Models Shown

By R S B

CONVENTION HALL DETROIT (MICH.)—With at least 30 more planes on exhibit than have ever before been gathered for a commercial aircraft show in this country the second annual All-American Aircraft Show at opening time, April 6, was unquestionably the most representative exposition of the aeronautic industry that has yet been offered the American public

In spite of the delightful Spring weather which drew crowds of Detroiters away from town on various recreation jaunts, officials reported that more than 10,000 people passed through the turnstiles within the first 24 hours of the Show. So great were the crowds seeking admission on the evening of the sixth that it was necessary to throw the doors open to the public half an hour before the time set for the formal opening. Although the show had been a weird jumble of packing cases and uncompleted exhibits three hours before opening time it was in order and ready for the public when the doors opened

Exhibits En Masse

Of the 106 planes scheduled for space at the affair, an even hundred were in place at the hour of opening. The remaining planes were placed in position during the next two days. According to unofficial estimates a total of a million and a half dollars worth of aeronautical equipment was contained under the roof of Convention Hall. In fact, so great was the quantity of equipment exhibited that the Show gave the impression of being over-crowded. Planes were "dove tailed" into each other and the accessory exhibits so numerous that many of the individual booths were of insufficient size to permit a really attractive and presentable display.

Apart from the usual crowds of sightseers in general who attended the Detroit affair, there was about 100 per cent industry representation. There was at least one executive from every airplane and engine manufacturing organization in the country to say nothing of accessory equipment and allied industry representatives.

First Plane Sold is Verville

As is usually the case at either an automobile show or an airplane show there were about 12 "first" sales at the All-American Aircraft Show. However, after careful checking up, where checking up was possible, it was more or less decided that the actual first sale of the Show was a Verville "Air Coach" which was sold five minutes after the public had been admitted into the Show. Second sale honors were awarded by concensus of general opinion to Flo Services Inc., which sold an Arrow Sport biplane. Many other sales the exact number of which is not obtainable at this time, were made during the week.

Following so closely on the recent Chicago show there were only about fourteen planes which received their first showing at Detroit. Among these were the Alexander "Bullet," the Cunningham-Hall cabin monoplane, The Knoll KN-1, the "Flamingo," the Parks cabin plane, the Kreutzer Air Coach, the Verville Air Coach, the Great Lakes training biplane, the Eastman "Sea Rover," the Rearwin Ken-Royce, the Curtiss-Reid "Rambler," the Doyle Oriole, and the Cardinal monoplane.

Engine Displays Complete

The engine exhibits were not only attractively arranged but complete in detail as regards the various types manufactured by the individual companies. Among the engine exhibits were to be found the leading commercial manufacturers such as Pratt & Whitney, Wright, Curtiss, Packard, Kinner, Axelson, Continental, Brownback, Dayton, etc.

A new feature of the Detroit showing this year was the inauguration of a bus service from Convention Hall to the Ford Airport. Hundreds of visitors to the Show took advantage of this service to journey to Detroit's leading flying field and inspect the demonstrators that lined the tarmac in front of the hangars.

An executive committee was elected by the commercial manufacturers section of the Aeronautical Chamber of Commerce on Monday, April 8. J. Don Alexander was elected chairman. Charles M. Monteith of the Boeing Aircraft Company was elected from the northwestern district. Alan Loughead, Lockheed Aircraft Company, from the southwest district, Thomas Hamilton Hamilton Metalplane Company, north central district, Richard E. Depew, Fairchild Airplane Manufacturing Corporation, northeast district. C. J. Brukner, Advance Aircraft Company, east central district. Robert Noorduyn, Bellanca Aircraft Company, northeast district.

The meeting approved the proposed invitation to distributors and dealers to join the Section at the special rates of $50 and $25 respectively. Discussions of airplane financing problems from a legal point of view and the advantages of group purchasing of airplane materials were included. It was announced by Clyde Cessna that a Wichita company has been formed already to buy materials for Wichita manufacturers.

Outboard Engine Used for Taxiing

SEATTLE (WASH.)—Vern C. Gorst recently taxied a seaplane on the surface of Lake Union with an outboard engine in order to demonstrate the use of such a power plant as an auxiliary to his seaplane engines. It is said that seaplanes in Alaska may be equipped with these power plants as a safety measure during fogs and heavy weather, for the small engine permits the pilot to hear fog horns when the engines of his plane might otherwise drown the warning sounds.

Metropolitan Offering Group Aero Insurance

NEW YORK (N.Y.)—With the risks of pilots now figured with great exactitude, the Metropolitan Life Insurance Company, this city, announces that aviation insurance is now accepted for group contracts. These contracts cover the personnel of business and other concerns at a lower premium, since the life expectancy of a large group can be estimated more accurately than that of a few individuals.

The pilots of the Nicholas-Beazley Airplane Company, Marshall, Mo., have taken out the first group insurance contract issued by the Metropolitan firm. No restrictive clauses are included in it and the benefits stated will be paid when claims are presented without respect to cause. The ground staff is included with the pilots. The contract involves approximately $50 000 of life insurance and the employer is paying the entire cost of the coverage.

Individual benefits are based on length of service and range from $500 to $1,500. Besides creating a death benefit, the inclusion of a total and permanent disability clause in the policies provides a temporary income for any employee becoming completely disabled before the age of 60. In such event he will receive the full amount of his life insurance in monthly installments, it is announced.

New Elias Directors Named

BUFFALO (N.Y.)—With the recently announced organization of the Elias Aircraft & Manufacturing Corporation, this city, to acquire the properties and assets of G. Elias & Bro., Inc., statement is made that the management of the company remains in the hands of the men who developed the business from its inception. Additional directors, however, have been named as follows: Alexander Klemin, Norman E. Mack, Treadway B. Munroe, S. Sargeant Volck, F. H. Ross, Jr., Nelson M. Graves, Clark L. Ingham, and A. J. Elias, who founded the business 48 years ago.

Crescent Plane in Flight Test

Showing Clarence D. Chamberlin's new "Crescent" plane, the craft being produced by the Crescent Aircraft Corporation of which he is technical director. Miss Thea Rasche, German flier, has signified her intention of flying a Crescent in a new endurance attempt

Pick-Up Apparatus Tested Successfully

ROOSEVELT FIELD (L.I. N.Y.)—Successful demonstration is reported here of a new pick-up catapult delivering mail, fuel, or supplies to a plane while in flight. Lieut. H. B. Clarke, former Army flier, piloted a plane over the device in the tests and picked up a 23 lb. mail sack five times and a 37 lb. can of gasoline once.

Following the tests, an announcement was made by Lieutenant Clarke that sometime in May he would attempt to break the world's refueling record, now held by the Fokker Question Mark," employing the new device for refueling purposes.

The catapult, fitted on a special mounting, releases a car on which the load to be transferred is placed. With this apparatus, the load is made to move at about the same rate as the passing plane until it is lifted thus the menace of a jar to the undercarriage is obviated.

Kitty Hawk Granted Certificate

HILLSGROVE (R.I.)—Following a period of development extending over nearly a year's time, the Bourdon Aircraft Corporation, this city, recently applied for and was granted approved type certificate No. 134, from the Department of Commerce for the firm's plane designated as the Kitty Hawk. The Kitty Hawk, a three plane open land biplane, weighs but 1,142 lb. empty, though having an approved load of 1,950 lb., according to the company's statement. The wing spread of the seven-cylinder Siemens-Halske powered plane is 28 ft. The fuel capacity is 43 gal. The craft is credited with a high speed of 110 m.p.h.

Supply Branch for Chicago

CHICAGO (ILL.)—Air Activities, Inc., this city will open a supply division on or about the 15th of April at 8-10 East Kinzie Street under the direction of John L. Nelson. Nicholas-Beazley goods will be carried.

New Designations For Waco Airplanes

TROY (OHIO)—The Advance Aircraft Company, manufacturer of Waco airplanes, announce that hereafter all models of Waco planes will be designated by numbers indicating the horsepower of the engine installed in the particular model.

The former model 10 with OX-5 will now be known as the Waco "90." The former Hisso craft will be known as the "150" and "180," respectively. The former Whirlwind 10-W will be known as the Waco "220" Straight Wing. The former Whirlwind 10-T or Sport Waco, will be known as the Waco "220" Taper-Wing. The new model powered with the J-6 5 cylinder 150 hp. Wright will be known as the Waco "150," and the new Taper-Wing with J-6 as the Waco "300" Taper-Wing.

Italian Firm Orders Hamilton

MILWAUKEE (WIS.)—The Hamilton plant here has received an order for a standard all-metal eight-passenger cabin plane for use in passenger and mail service between Venice and Rome, Italy, according to Charles F. Barndt, factory manager. The order involves $26,500. The purchaser is a government subsidized company which has applied for a license, on a royalty basis, to build Hamilton planes in Italy.

Fairchild Goes To Holding Group

The Aviation Corporation Reports Negotiations Closed

NEW YORK (N. Y.)—The reported acquisition of the Fairchild Aviation Corporation's interests by The Aviation Corporation has been confirmed by the latter. The Fairchild concern will go under the banner of the latter organization without any change in management, it is announced the step being taken to provide the holding company with manufacturing subsidiaries and additional capital for the Fairchild group.

The Aviation Corporation is reported to be continuing its negotiations for control of the Universal Aviation Corporation, the most recent announcement in this regard being that enough stock in the latter had been secured to assure the aquisition.

Included in the Fairchild group are Fairchild Aerial Camera Company, Fairchild Aerial Surveys, Inc., Fairchild Flying Corporation, Fairchild Aviation Ltd., of Canada; Fairchild Caminez Engine Corporation, Fairchild Airplane Engine Manufacturing Corporation and Compania Mexicana de Aviation of Mexico.

The tangible assets of these companies, according to Sherman M. Fairchild, totals about $7 000 000. Authorized Fairchild stock has been increased 190 000 shares, it was said, to facilitate the merger. Through the added financing which will be available through the holding company, it is planned to expand the units and develop manufacturing methods.

MacClatchie Radial Flown East

LOS ANGELES (CALIF.)—An extensive Eastern tour is being conducted with the new MacClatchie 7 cylinder radial L-head aircraft engine mounted in an Air King biplane piloted by T. C. Alexander chief engineer of the MacClatchie Airplane Engine Division, and with J. W. MacClatchie, president, as passenger. After visiting Kingman and Winslow, Ariz., Albuquerque, N. M., Colorado Springs, Wichita, and Kansas City, the engine was to be brought to Detroit and will then be flown through most of the eastern territory. The MacClatchie engine is rated at approximately 150 hp. and is featured by a low overall diameter of 35 in. and the elimination of rocker arms. The engine is scheduled to be tested by the Department of Commerce sometime during June.

Stout-D & C Recapitalizes

ALBANY (N.Y.)—Stout-D & C Airlines, Inc., Buffalo N. Y., has filed a certificate here changing its capital from 200 000 shares to 300 000 shares no par value stock.

Flamingo Guarantee Extended to Six Years

CINCINNATI (OHIO)—Extension of the guarantee and warranty on airplanes of their manufacture from the customary 90 days to a period of six years was made on April 1 by directors of the Metal Aircraft Corporation, this city, builders of "Flamingo" seven-passenger all-metal monoplanes.

The directorate of the company believes its organization to be the first in the world to extend the warranty period beyond the usual three months. Because of the relatively long time for which the Metal Aircraft guarantee is to be henceforth in force, a stimulus to public interest in aviation is anticipated by the Cincinnati organization as a result of its step.

According to directors of the company a series of tests has proved to them that ten years of useful life is a conservative estimate of the longevity of their planes. These tests were carried out under the supervision of Ralph R. Graichen, general manager of the corporation, and associates.

The company's new six-year guarantee is the standard warranty adopted by the trade, except for the time extension noted covering defects in material and workmanship.

Flamingo planes are made in one of the most modern factories in the country, straight-line production methods and the most advanced manufacturing equipment being utilized. At the time of its announcement the company is said to have orders booked that would require an entire year to fill; it is therefore reported that arrangements for an anticipated increase in business must be made.

Myhres Completes Long Trip in Simplex

DEFIANCE (OHIO)—H. S. Myhres of Los Angeles, recently returned to the Defiance airport after a 12,000 mile trip in a Simplex Aircraft Corporation monoplane to the West Coast and return. Prior to starting the western trip, Myhres had flown the same Simplex to Florida and to New York. He reports a total of 30,000 miles of flying in five months in this Simplex craft without need of repair either to the plane or to the Warner engine which powers it.

Myhres, who has returned to Defiance to flight test the new five passenger Simplex recently completed, won the first prize in the Class A San Francisco to Los Angeles race at the 1928 National Air Meet, Los Angeles. He plans to take the 1929 Simplex racer into a number of the important races this year.

Utica Service Recapitalizes

UTICA (N. Y.)—Utica Flying Service, Inc., this city, has filed a certificate changing its capital of no par value stock to 4,200 shares.

Aircraft Year Book Out

NEW YORK (N. Y.)—The Aeronautical Chamber of Commerce of America, with headquarters in this city, has just issued its eleventh annual edition of the Aircraft Year Book. The new edition contains more than 250 pages of text, 100 pages of technical drawings of planes and engines produced during 1928, 190 illustrations, airways maps of the United States and Europe, and a comprehensive appendix covering the field of aviation in its various branches.

Universal Establishing School Base at Fairfax

KANSAS CITY (MO.)—The Universal corporation has signed a long term lease with the Fairfax Airport Company at Kansas City for a tract of ground 400x190 ft. on Fairfax Airport to be used by the new Universal school shortly to be opened there. No announcement can be made yet as to whether Universal will continue to use Fairfax airport for its passenger and mail service or will transfer this branch to the Municipal airport.

Universal plans to erect immediately two 120x170 ft. hangars on Fairfax for school use and to install other equipment.

Fairfax airport is approximately one mile square but before signing the contract Universal insisted that additional practice fields be purchased by the company and made available. Universal officials held that with the rapid strides being made in aviation, even such a large field as Fairfax could not in a year or two accommodate all of the transport and school planes from various companies which have taken leases. As a result, the airport owners negotiated for three 100-acre fields nearby which will be available to the school and additional ground also is being purchased.

Chain of Schools Planned by Pioneer

OMAHA (NEB.)—Pioneer Aircraft Company will organize approximately 25 schools of flying instruction in Nebraska, Frank Grace, president, announces. These will be scattered over the state, with one about every 75 miles. By fall it is expected that at least eight planes and an equal number of pilots will be employed in the school, with one plane and one instructor being required for every three schools, furnishing instruction twice a week.

Charles Kenwood is to be general manager of the system, with Chief Bowhan as chief pilot. The company will have the agency for both the Waco and Cessna planes.

At the present eleven students are receiving flying instruction from the company's school at the municipal field, with Pioneer and Omaha Airways, Inc., which gives a ground training course, co-operating in providing a complete aviation instruction.

Approve Propellers and Foreign Engines

WASHINGTON (D. C.)—Approvals for four more propellers, numbers 6 through 10, have now been issued by the Department of Commerce. Seven foreign-make engines furthermore, have been approved for license without the type certificates.

The airscrews are as follows, according to certificate number, make, diameter, pitch, horsepower, and speed: No. 6—Westinghouse, 8 ft. 10 in. x 6.51 in., 250/2000. No. 7—Westinghouse, 8 ft. 6 in. x 5.69 in., 100/1500. No. 8—Supreme, Design 750, 8 ft. 6 in. x 5.25 in., 100/1400. No. 9—(pending). No. 10—Dakota Pahlin, 8 ft. 4 in. x 5.25 in., 100/1400.

The power plants, according to make, designation, type, cooling, and horsepower at rated revolutions per minute, are as follows: *Bristol-Jupiter, 9 cylinder, radial, air, 460/1765; *Bristol-Jupiter, 9 cylinder, radial, air, gear drive, 500/2000; Cirrus Mark III, 4 cylinder, in-line, air, 85/1900; Junkers L5, 6 cylinder, in-line water, 300/1400; Siemens-Halske SH-13, 5 cylinder radial air, 82/1666; Siemens-Halske SH-14, 7 cylinder, radial, air, 105/1628; and *Salmson AD-9, 9 cylinder, radial air, 40 hp.

*Subject to special condition.

Kinner Engine Firm Now in Reorganization

LOS ANGELES (CALIF.)—Reorganization of the Kinner Airplane and Motor Corporation into the Kinner Airplane Engine Corporation with the entrance of considerable new capital has been announced by W. B. Kinner, president.

The new move will provide the Kinner firm with $1,000,000 in cash, it is stated with a reserve of 260,000 shares of unissued stock. It is said that the Consolidated Aircraft Corporation will place an order for 1,000 Kinner engines to be delivered at the rate of 100 per month, and will also invest in a considerable block of the new Kinner securities.

Kinner engines are now being built at the rate of four per day with the production schedule calling for ten engines per day before July.

Plans Five Stinsons a Day

DETROIT (MICH.)—Edward A. Stinson, president of the Stinson Aircraft Corporation, recently announced plans for producing five planes per day, with production centering on the Stinson Junior, a four place cabin monoplane powered by a Continental or Wright engine of 165 hp. The expansion of production is made possible by the corporation's new factory on the new Detroit-Wayne Industrial Airport and is to be devoted to three models.

Mohawk to Build Three New Models

Will Offer Two 2-Seaters And a Twin-Engined Plane

MINNEAPOLIS (MINN.)—Three new types of airplanes will be manufactured here by the Mohawk Aircraft Corporation, Col. G. P. Murphy, vice president, announced recently.

The new planes are a two-place cabin plane, a two place open cockpit plane on the same fuselage, and a three-place twin-engined cabin plane. All the craft are of the low-wing monoplane type similar to the Mohawk Pinto, which will continue to be manufactured.

Specifications and flying performance of the single engined planes are reported practically identical. Both are powered with 110 hp. Warner Scarabs. They have a wing span of 35½ ft., and length of 23 ft. The chord varies from a maximum of 75 in. to 31 in.

Have High Cruising Speed

Flight tests, it is reported, have demonstrated that the plane has a top speed of 145 m.p.h., cruising speed of 125 m.p.h., initial climb of 1,100 ft. per min., take-off in seven seconds from dead stop, and landing speed of 37 m.p.h. Gliding angle is one to eight, service ceiling 15,000 ft. and absolute ceiling 17,000 ft. Fuel consumption is eight gallons of gas per hour at top speed and one-quarter gallon of oil. Cruising range is 600 miles.

The weight empty is 1,000 lb., and the useful load is 700 lb. A full cantilever wing, internally braced and tapered, is used. The fuselage is of welded chrome-molybdenum steel. Price of the open plane is $6,000 and of the closed $6,750.

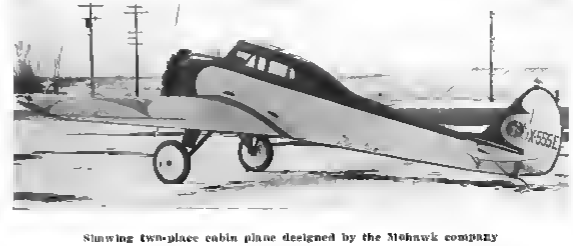
No performance figures for the twin-engined plane have been revealed as yet. The craft will have a wing span of 41½ ft. and a length of about 24 ft. The two engines will be mounted on top and slightly in front of the wings, the mounting being streamlined into the wings. Wings will be of steel tubing from the roots to the power plants, which will be fitted in the wings.

At present it is planned to use the 55 hp. Rover four-in-line engine, and the craft will be designed to maintain flying speed on either power plant. Price of the plane, which has not yet been test flown, has not been revealed.

John B. Akerman is designer of all three of the planes all of them scheduled to be in commercial production by the end of April.

Breese to Start Building Soon

SALEM (ORE.)—Operations at the Breese Aircraft Corporation at Beaverton will start immediately, according to Nelson E. Jones, general manager, who reports receiving a carload of machinery and two planes from California.



Stinwing twn-place cabin plane designed by the Mohawk company

Clark Designing Huge Craft

BUFFALO (N. Y.)—Col. V. E. Clark and a corps of assisting engineers, have been at work for about eight months, it has been disclosed, on a plan for a new multi-engine all-metal plane, which is reported to be scheduled for early manufacture in a plant to be built by a subsidiary company of The Aviation Corporation. The company will build a series of large all-metal flying boats as well, it is said. The plans have been kept a close secret.

Canada Imports More U. S. Planes

WASHINGTON (D. C.)—Canadian airplane imports during the last year increased nearly 400 per cent over those of 1927, reaching a total value of $1,756,086, according to a report just received here from American representatives in Canada.

The United States supplied $1,202,249 worth of planes and parts, an increase of 321 per cent, while imports from the United Kingdom rose from $64,751, in 1927, to $542,403. Airplanes imported last year totaled 183, as compared with 34 in 1927, the imports from the United States increasing from 25 to 98 airplanes and from the United Kingdom from 6 to 90.

Boeing Aircraft To Mail Operators

Orders of W.A.E., N.A.T., and Robertson Announced

SEATTLE (WASH.)—Sale of mail planes to National Air Transport, Western Air Express, and Robertson Aircraft Corporation is announced by the Boeing Airplane Company, this city. The firm expects additional sales furthermore, following demonstrations of the new mail cargo plane which in company parlance, "Three million miles of flying built."

Western Air Express purchased four of the new 95's, which have a top speed of 142 m.p.h. with 1,610 lb. of mail-express, for immediate delivery. They will be placed on the Salt Lake-Los Angeles route which has one of the heaviest poundage loads of any route in the country. Western Air Express also purchased one of the Boeing Bl-E seaplanes which have a capacity of six passengers. It will be used in flights around Catalina Islands. It is powered with a 425-hp. Wasp.

N. A. T. Orders a 95

National Air Transport has taken delivery of one of the new model 95's for operation between Chicago and New York, where it now operates a Boeing Model 40-B.

The Robertson Aircraft Corporation purchased a special Hornet powered 40-B combination mail and four passenger plane, and will use it on the Omaha-Kansas City-St. Louis mail route which will be flown in the immediate future.

Another Boeing sale was of a seaplane to George S. Cochrane who will use it in mining exploration work in Alaska and for transporting miners and supplies from tide water to distant river points in the territory.

Prudden in Atlanta Project

ATLANTA, (GA.)—Following selection of this city as a site for a new airplane manufacturing plant by George Prudden and Edward Whitehead, $300,000 capital is being raised to finance the production of tri-engined all metal airplanes. Leading capitalists and business men of the city are reported backing Prudden and Whitehead in the venture. A wind tunnel model has been tested at Massachusetts Institute of Technology, and a lease has been taken on a factory building here for manufacture of the plane, said to be an eight place craft.

"Cruizaire" Flight Tested

CLARINDA (IA.)—Trial flight of the "Cruizaire," an Iowa-made monoplane designed by the Dunn Manufacturing Company, was a success engineers report. The plane is owned by the Southern Iowa Airways Company. It is powered with a K-5.

Aeronautical Chamber Adopts Air Show Policy

NEW YORK (N. Y.)—Recommendations of the Aeronautical Chamber of Commerce's show committee regarding the stand to be taken on aircraft expositions have been adopted by the Chamber. Announcement of this policy is made by Charles L. Lawrance, chairman of the show committee, which includes C. J. Brukner, C. V. Cessna, C. H. Colvin, T. Z. Fagan, E. N. Gott, H. M. Hanshue, P. G. Johnson, H. P. Mammen, W. B. Mayo, H. C. Ritchie, F. H. Russell, and A. A. Woodruff. Mr. Lawrance's statement is as follows:

"The Aeronautical Chamber of Commerce, having discussed the show problem at a general members' meeting, held in Chicago last December and at the annual meeting of members, held in New York, last January, and having had opportunity, since then, further to ascertain the desires of its members, announces that:

"The members of the Chamber will neither participate in nor sanction aircraft shows of any type which are initiated and/or operated for the benefit primarily of professional promoters, it being the intention of the Chamber that profits from aviation shows shall be devoted as far as practicable to the development of aviation.

"In order that exhibits of varying size and scope may be accommodated, provision is made for three types of shows. Class A are international or national, of which not more than one will be held annually. Class B shows are regional. In these manufacturers are under no obligation to enter. Class B shows being regional, the manufacturers and distributers in the district concerned may exhibit if they desire. Class C shows are strictly local and are designed primarily to accommodate local dealers. Local manufacturers or distributors may exhibit in Class C shows if they have special reasons for so doing. In Class B and C shows ample provision is made for satisfying the natural desire of both large and small communities to share in the development of aviation by the holding of aircraft shows. At the same time the industry protects itself from exploitation and from excessive expenditures in shows that have little economic justification.

"In putting this policy into practical effect the Chamber is utilizing its subsidiary, the Aeronautical Expositions Corporation and in addition has established a Show Department which will manage shows held by the Aeronautical Expositions Corporation and will be available for assistance in the management of other shows which the Chamber sanctions."

Kreider-Reisner to Fairchild

FARMINGDALE (L. I., N. Y.)—Official announcement is made in the latest Fairchild Aviation *News* that the Fairchild Aviation Corporation has acquired majority stock ownership in the Kreider-Reisner Aircraft Company, Hagerstown, Md. An addition to the latter firm's plant is being constructed offering 32,000 sq.ft. more floor space.

Glass Firm Has New Name

PITTSBURGH (PA.)—"Duplate Corporation" is the new name of the Pittsburgh Safety Glass Company, following a recent change.

Record of Boeings Reported

SEATTLE (WASH.)—Concerning the serviceability of aircraft, the Boeing Airplane Company submits interesting data on the performance of two of the original Boeing Model 40 A's, which inaugurated the transcontinental air mail line of the Boeing system. At the end of eighteen months of continuous service, No. 88 had flown 1,297 hours, at an average speed of 101.3 m.p.h., or 131,386 miles, while No. 92 flew 1,300 hours at an average speed of 101.8 m.p.h., or 132,340 miles. Both craft are still in good condition.

Merger at Omaha Forms Midwest Firm

OMAHA (NEB.)—Formation of the Midwest Aviation Company, through consolidation and expansion of the Nebraska Travel Air Company of Omaha and North Platte and the Burnham Miller Flying service of Council Bluffs, Ia., is announced here by Lawrence Enzminger, president.

The company has the Travel Air agency for both Nebraska and Iowa. It will open air service branches at Grand Island, Neb., and Sioux City and Des Moines, Ia., shortly and expects, within the next eighteen months, to have hangars in more than 40 of the larger cities of the two states.

Headquarters will be in Omaha. Construction of a 24x36 ft. office building and a 100x100 ft. steel hangar is to be started immediately at the municipal field here.

Midwest Aviation School will be a branch of the company. Jack Knight, air mail pilot, is to be in charge. It will offer a ground course, and flight courses of 10, 25, 50, 100, and 200 hours, ranging in cost up to $2,000.

Equipment on hand includes five Travel Air biplanes with OX engines. A Warner Scarab and a Wright J-6 biplane have been ordered, as well as a Challenger-powered light monoplane and a seven-place Wright J-6 monoplane.

The company is capitalized at $115,000 and is authorized to capitalize at $2,250,000.

To Make Parts and Accessories

KANSAS CITY (KAN.)—Beacon Airways of America, Inc., which is building a $90,000 headquarters structure at Fairfax Airport here, will enter the airplane parts and accessories manufacturing field soon after it is established in its new quarters, according to Franklin Hemmway, president. The concern represents Mono airplane corporation products, American Eagle and Mahoney-Ryan planes and is operating a used plane department.

Firms Merge at Memphis

MEMPHIS (TENN.)—Tri-State Airways, Mid-South Airways, and the Memphis Aviation & Transport Company have merged here to form Memphis Aviation Interests.

To Hold Aviation Meet At Oakland Port April 20

OAKLAND (CALIF.)—Cash prizes totaling $2,000, silver cups and other individual awards are expected to bring forth numerous entries in the air races to be held at the Oakland municipal airport April 20. The event is sponsored by the Northern California Section of the Society of Automotive Engineers and will be sanctioned by the National Aeronautic Association. It is the plan of the S.A.E. to make this race an annual event.

A unique feature of the meet is the 15-mile race exclusively for women pilots. Two Jackson Furniture Company trophies and $250 in cash will go to the winners of this event. The Shell Derby, a 20-mile race for OX-5 planes, will be the first event on the program. Cash prizes totaling $500 and a special individual award to the winner have been posted for this race.

The Standard Red Crown Classic will be for planes powered with engines under 800 cu.in. displacement and will be run over the same course, with similar prize awards for the winners. The dead stick landing contest winners will receive cash prizes to the amount of $200 and the first prize winner also will get the Associated Oil Company trophy.

The Richfield Oil Company's race, a 20-mile free for all, will close the field events for the afternoon. Special individual awards and $500 in cash will go to the winners of this race.

New Standard Firm To Announce Trainer

PATERSON (N.J.)—Extensive flight tests are to be made on the first two of the New Standard Aircraft Corporation's new training planes. This type craft will be formally announced to the trade in a few weeks, according to Mr. Daws of that firm, who added that it will be moderate in price.

The trainer, which is powered with a Cirrus engine, is a biplane with ample stagger and gap. The fuselage of the plane is constructed of open-channel and section duralumin similar to that used in the larger models. The wings, of spruce, are interchangeable.

It is announced that the trainer represents almost six months design work on the part of Charles Healy Day and his staff of engineers. The new training plane, according to Mr. Day, embodies the same structural strength as the old J-1, with the addition of many refinements and better performance.

Warren Aero School Moves

LOS ANGELES (CALIF.)—Announcement has been made by the Warren School of Aeronautics of transfer of the school activities to a new and larger building on West Washington Boulevard much closer to downtown Los Angeles than was the former location. The Warren School is one of the oldest in the West.

PERSONAL

LIEUT. ISAIAH DAVIES will remain in Kansas City at least another year in charge of Government aviation activities.

RICHARD W. MACKIE and W. HEATH PROCTOR have been appointed division superintendents for Colonial Air Transport and Colonial Western Airways respectively.

CAPT. RICHARD DUNCAN, veteran of the Canadian and British Air Services, will conduct classes at the school of the Curtiss Flying Service, which has started general operations at the Fairfax Airport, Kansas City.

E. P. BOYER has been elected vice-president of the Alexander Milburn Company.

FRANK L. HALE has been appointed general business manager of the Curtiss Flying Service, Inc., supervising business management for the entire nation-wide chain of the Curtiss organization.

T. W. FRANKLIN has been appointed assistant instructor at the Commercial Airways Flying School, Kansas City.

J. A. MCMILLAN, veteran of ten years flying with about 2,000 hours to his credit, has been appointed assistant director of sales of the St. Louis Aircraft Corporation, a subsidiary of the St. Louis Car Company. For the last three and a half years he has been with the Missouri Aircraft Company.

FRANK PHARES, formerly of the Dallas *News*, has been appointed traffic manager of the Southwestern Air Fast Express with headquarters in Dallas.

LEE SMITH is the new head pilot at the Madison, Wis., airport. He is a brother of Chad B. Smith, veteran air mail pilot.

JACKSON BROWN, JR., 701 Kittridge Building, Denver, Colo.; J. C. MCDOUGALL, Alaska Building, of Seattle, Wash., and CARL P. LOHR, 401 National Bank of Commerce Building, St. Louis, Mo., have been appointed district sales agents for the Roller-Smith Company of New York City.

H. M. SCHAAB has been appointed manager of steel door sales of the Truscon Steel Company, Youngstown, Ohio.

CAPT. IRA C. EAKER was to take over the duties of operation manager at Hoover Field, Washington, D. C., this week, having been granted a four months' leave of absence from the Air Corps.

A. J. CAROLL, Birmingham manager of the Southern Air Transport has been transferred to the operation department at Fort Worth, Texas.

LEAKY REDUS has been appointed Birmingham, Ala., traffic manager of the Southern Air Transport.

GEORGE LOWERS has been appointed chief pilot for the Master Aeronautical Corp. of Grand Forks, N. D.

R. S. MCKIM, for the past seven years a member of the Engineering Division of the Air Corps at Dayton, O., and who has just recently returned from an extensive aerial survey of fruit properties in Honduras and a mail and passenger line to the West Indies, has joined the Aeronautical Department of Vallentine & Company, it is reported.

MAJ. P. G. KEMP has resigned as vice-president in charge of traffic and public relations of the Universal Aviation Corp. at Chicago.

LUDWIG MUTHER has been appointed chief engineer of the Alexander Aircraft Company at Colorado Springs, Colo.

DON R. BEARDSLEE will be chief instructor of the New York Airways, Inc., at Norwich, N. Y., Airport, 30 miles from Binghamton.

BRUCE PALMER has been appointed district sales manager in charge of the Detroit office of the Thompson Aeronautical Corporation.

K. S. LINDSAY, formerly associated with the New England Aircraft Corporation, has been appointed special field representative of the Dennison Airplane Sales Corporation.

ROBERT MINICK, pilot; EARL BRODD, general service manager; FARD STODDARD, traffic manager, and EUGENE JACOBY, stockroom clerk, have been added to the staff of the Curtiss Flying Service, Inc., at Moline, Ill., recently.

JOHN P. KIRK has been added to the staff of instructors of Tri-State Airlines of Sioux City, Neb.

New Firms Announced

TEXHOMA AERONAUTICAL SERVICE, INC., Fort Worth, Tex.; capital $50,000; officers: Tel T. Pendleton, president, and Randolph Page, general manager; to operate Stinson plane agency.

FEDERAL AVIATION CORPORATION, New York City, capital to be several million dollars; to function as holding company.

PENNSYLVANIA AIR TRANSPORT CORPORATION, New York City; capital $50,000; incorporators: Rose Lippner, Otto Fischer, and Walter N. McKalie, all of Brooklyn, N. Y.; Lazarus I. Levine, 119 Nassau Street, New York, attorney, to operate aircraft.

ARTHUR C. GOEBEL AVIATION COMPANY, INC., Kansas City, Mo., officers: Arthur Goebel, president; Conrad H. Mann, chairman of the board; Lou E. Holland, vice-president; Herbert M. Woolf, vice president; Thornton Cooke, treasurer; Wallace J. Ferry, secretary; to open aviation school, with firm's buildings at municipal airport.

LA CROSSE AVIATION COMPANY, La Crosse, Wis.; officers: J. E. Richmond, president, with W. V. Flood and W. J. Holland, pilot as members; to offer flights, using Fairchild cabin plane.

NEW ENGLAND AIR TRANSPORT COMPANY, Hillsgrove, R. I., to build sport biplanes and four-place cabin craft and eventually operate a freight and passenger air service through New England.

COLONIAL FLYING SERVICE, INC., chartered under Delaware laws, New York City office at 270 Madison Avenue, capital 25,000 shares preferred $100 and 50,000 shares no par value common stock; James A. Walsh, assistant secretary of firm, to engage in flying activities in New York State.

AIRVIA TRANSPORTATION COMPANY, INC., chartered under Delaware laws; capital 100,000 shares no par value stock; Joseph J. Strassburg, president; to operate aircraft in New York State.

AERO MOTORS, INC., Portland, Ore.; capital $500,000; incorporators: Thomas Bilyeu, Robert B. McElroy, and Robert C. Jackson; to deal in airplanes, engines, parts, and engage in manufacture.

ENSEE AIRCRAFT CORPORATION, Downey, Calif.; capital stock of $1,000,000; incorporators: E. M. Smith, James E. Long, and Charles D. Donnelly, all of Los Angeles.

TRADE TIPS

It has been reported that

R. O. Lindsay, who is organizing a company with $600,000 capital in New York City to manufacture a two-place biplane, states he would welcome catalogs and quotations from engine and accessory makers.

The Aeronautical Chamber of Commerce is in receipt of an inquiry from E. Z. Roberts, care Kensley, Millbourn & Company, Ltd., 40 Rector Street, New York City, who is desirous of representing manufacturers of aircraft and equipment in Australia.

Nicholas Colas, consulting engineer, Apartada 267, Santiago de Cuba, has just completed a trip along the coast of Central America having in view the selection of airport sites. He reports the field opened to engineers by this industry has no limits."

Bids on construction of an administration building at Bowman Field, Louisville, Ky., are being taken by the Air Board of that city. The structure is to cost about $20,000.

R. O. Bradley, of Chickasha, Okla., is drawing plans for a $50,000 airport to be located at Anadarko, Okla.

The Nicholas Beazley firm, Marshall, Mo., is reported having plans completed for construction of a 50 x 150 ft. airplane finishing plant in Marshall.

Omaha, Neb., is soon to begin many improvements at the municipal airport. Two hangars 90 x 100 ft. and 60 x 100 ft. will be included.

Spartan Aircraft Company, Tulsa, Okla., is taking bids on erection of a hangar at the Tulsa Municipal Airport.

Master Aeronautical Corporation, Grand Forks, N. D., of which George B. Reynolds is president, will soon begin construction of a six-plane hangar. The Pierre Airlines Company, Pierre, S. D., furthermore, plans a hangar at the Walter Smith Airport that city, while Upper Peninsula Airways, Inc., Escanaba, Mich., plans a hangar at Hancock, Mich.

BRIEFLY

Report is made by the Boeing firm at Seattle that its airplane plant is now employing 1 350 persons, representing the largest payroll in its history

Executive offices of the American Eagle Aircraft Corporation have now been moved to the company's new building at Fairfax Airport, Kansas City. The factory was brought to the field a month ago.

With Art Goebel as pilot the "Black Hawk," first biplane of the Butler Aircraft firm, Kansas City, has been taken on its first cross-country test flight a trip being made to San Antonio and return with side journeys bringing the total to 1,478 miles Wilton M Briney, sales manager, made the flight with Colonel Goebel

Negotiations are pending between officers of Northern Airways, Wausau, Wis., and the Oshkosh, Wis, airport corporation, for the leasing of the Oshkosh airport by the Wausau concern, according to Maj John P. Wood, Northern firm president

Plans for a $140 000 000 airplane accessory holding company involving the Bendix Corporation Curtis Aeroplane & Motor Corporation, Wright Aeronautical Corporation, Electric Auto-Lite Company Stromberg Carburater Company and Scintilla Magneto Company have been reported in New York City

A nation-wide system of retail distribution is rapidly being established by the Consolidated Instrument Company, according to J Leopold, president.

Recent sale of five Waco planes is reported by New York Aircraft Distributors, Inc, Roosevelt (formerly Curtiss) Field, L. I, N. Y.

The Mohawk Aircraft Corporation of Minneapolis is reported to be establishing a branch factory at Chattanooga

Word from Montreal states that Fairchild Aviation, Ltd, plans to figure in a merger of Dominion aviation firms with International Airways of Canada, Ltd, and Canadian Airways Each company, it is said, would continue as a separate unit.

Tickets for the trans-Atlantic and around the world flights of the Graf Zeppelin are now on sale at the San Diego office of the Hamburg American Steamship Line, it is reported Passengers may board the Zeppelin for the around the world flight at San Diego, it is said.

The San Francisco Bay Toll Bridge Company has placed a revolving beacon and a steady beam directional projector on each of the two lift towers of the structure One direction beacon points toward Oakland airport and the other towards Mills Field, San Francisco

The Chilton Directory of the aeronautical industry has been published again after a lapse of about fifteen years with listings of aircraft, airport and auxiliary products and including a compendium of statistical data on the progress of aeronautics generally. Copies are available for $1 to members of the industry.

An aluminum hoop to which is attached a timing device for the release of a small parachute has been tested successfully at Kansas City by A H Reed and C W Turner for use in delivery of mail from planes without necessitating a landing

Fairfax Airport, Kansas City, is now accessible by bus which the street car company there has put in operation on a 17 minute schedule from the nearest street car point.

Poundage on the Boeing system has increased about 150 per cent, during the first two months of this year compared with the same months a year ago More than 276 000 lb of mail were carried in January and February this year

It is understood that Colonial Western Airways, Inc., has arranged with the Endicott-Johnson Corp to use the Binghamton, N Y, airport on its proposed direct line between New York and Buffalo

Lieut. Claudio A Mejia, Argentine pilot, has purchased the Fokker plane "Friendship" from Donald Woodward, Leroy, N Y. Lieutenant Mejia plans to fly the craft from Buenos Aires to Spain this Summer

Travel Air plane deliveries for March are reported to have topped the $300,000 mark, bettering the record for that month last year by $200,000

Earl Rowland and Tex Lagrone have announced their intention of flying the Gardner Cup Races to be held May 28-30 at St Louis

Miss Mazie Dunlap youthful Oakland aviatrix announces she will attempt a woman's endurance record shortly using a Hisso-Eagle rock.

Two persons were recently dropped successfully from a Ryan plane at Mercer Airport Trenton, N J with Floyd Smith's new safety parachute seat with which the passenger slides through a trap in the flooring when the pilot pulls a lever.

Colin S Caldwell has been using an Avro Avian plane in the Arctic to spot seals for crews in search of the fur-bearing animals.

Post Office Department officials and representatives of Savannah, Ga, and Charleston and Columbia, S C, are reported to be conferring relative to the inauguration of an air mail system in that section

Increase in Wright stock from 500,000 to 1.500 000 shares has been approved by stockholders.

Some 700 planes are to be added to the Army and Navy during the fiscal year beginning July 1. Army expenditures will total $12,531,724, while the Navy's will reach $16 500,000

Preliminary plans for Newark's air show provided for 108 booths but demand for space is reported to have occasioned an additional double row of 40 booths.

Representatives Named

WRIGHT—Mid-West Airways Inc., Milwaukee, of which Val Zimmerman is vice president, named Wright company service station

WACO—New York Aircraft Distributors, Inc Roosevelt Field (formerly Curtiss Field), L I, N. Y., of which L M Brown is president, assignee Fairfield County Conn., in addition to New York territory

STINSON — Texhoma Aeronautical Service Inc, Fort Worth, Tex., of which Randolph Page is general manager, exclusive sales franchise in Texas and Oklahoma.

AIRMASTER — Commercial Aircraft Corporation, Tulsa Okla., of which L. U. Patterson is president, Northeastern Oklahoma rights

TRAVEL AIR—Robertson Division Universal Aviation Corporation, St Louis Mo.: officially named distributor for Southern Illinois all of Missouri with the exception of a few counties in the vicinities of Springfield and Joplin, and part of the State of Kansas adjacent to Kansas City

AERONAUTICAL CALENDAR

April 6-14	Second Annual All-American Aircraft Show of the Detroit Board of Commerce, Convention Hall, Detroit, Mich.
May 1-3	Joint meeting professional divisions, American Society Mechanical Engineers, Detroit, Mich
May 4	National Elimination Balloon Race for the Litchfield Trophy, Pittsburgh, Pa
May 7	International Aeronautic Conference and Exhibition, Seville, Spain
May 14	Fourth Annual Aircraft Engineering Research Conference, Langley Field, Hampton, Va.
May 15-20	First International Congress on Sanitary Aviation, Paris, France.
May 16-18	Cleveland Airport Convention, Hotel Cleveland, Cleveland, Ohio, under auspices of the Aeronautical Chamber of Commerce
May 18	Curtiss Marine Trophy Race, Potomac River, Anacostia, D. C., under auspices of the Aero Club of Washington, N.A.A.
May 25-June 1	First Annual Newark Air Show, State Armory, Newark, N. J.
May 25-June 1	First Annual St. Louis Aircraft Show, New Coliseum, St. Louis, auspices Jackson Johnson Post No. 72, American Legion, Headquarters Hotel Chase
May 27-30	American Society of Mechanical Engineers, National Aeronautic Meeting, Hotel Jefferson, St. Louis.
May 27-June 2	Indianapolis Aviation Show of the Indianapolis Aircraft Association, State Fair Grounds
May 28-30	Gardner Annual Trophy Race, St. Louis, Mo
June 27-30	International Light Plane Meet, Amsterdam, Holland
July 15-27	International Aircraft Exhibition at the Society of British Aircraft Constructors, Olympia, London.
Aug. 24-Sept. 2	National Air Races and Aeronautical Show, Cleveland, O
Aug. 26-28	Society of Automotive Engineers, Cleveland Aeronautic Meeting
Sept. 6-7	Schneider Cup Race over the Solent, Cowes, England
Sept. 7-15	International Aircraft Exhibit of 1929, Coliseum, Chicago, Ill.
Sept. 28	Gordon Bennett Balloon Trophy Race, St. Louis, Mo.
Oct. 12-27	Southwestern Aircraft Exposition, State Fair Grounds, Dallas, Tex.
Dec 1-9	International Aeronautical Exposition of the Aeronautical Chamber of Commerce, Chicago

AIRPORTS AND AIRLINES

Gorst Arranging Service to Alaska

SEATTLE (WASH)—A third group is planning to establish air passenger service between this city and Alaska This concern, recently organized as the Gorst Air Transport and headed by Verne Gorst, plans to operate a fleet of Loening ten place amphibians, the first of which has been received and will be used in a survey of the route

Passenger service is expected to start very soon after the survey is completed. Efforts are being made also to obtain a Government contract for carrying mail in connection with this operation The company also contemplates engaging in the manufacture of seaplanes on a large scale in a local factory

Mr Gorst is an owner of Barnes & Gorst, the air mail contractor between this city and Victoria, B. C, and is also vice president and director of the Pacific Air Transport, which he founded and which is now a Boeing subsidiary

The other two concerns interested in services to Alaska are the Union Air Lines of Portland, Ore, and the Boeing System of this city

Texas Company Opens New Lines

FORT WORTH (TEX) — Two new passenger lines of the Southern Air Transport, the third and fourth of the system, were placed in operation on Saturday, March 30, between Fort Worth-Dallas and San Antonio, and Forth Worth-Dallas, Galveston and Houston One round trip daily will be made by the company's Travel Air J-6 cabin monoplanes The following schedules have been arranged Leave Fort Worth 8 a m, Dallas 8 30 a. m, Waco 9 30 a. m., Austin 10 45 a. m and arrive San Antonio 11 30 a. m The plane will leave San Antonio at 3 p. m and arrive in Fort Worth at 6 30 On the Fort Worth-Galveston line the plane will leave Fort Worth at 8 a m, Dallas, 8 30 a m, Waco 9 30 a m Houston 11 20 a. m and arrive Galveston 12 noon

Acquire Buffalo Seaplane Base

BUFFALO (N Y)—Stout-D & C, Air Lines, Inc., has acquired the Gold Wheatfield farm on the Niagara River, 7 miles north of this city, according to reports for development as a local terminal for the Buffalo-Cleveland-Detroit air line which it expects to put into operation this summer This seaplane terminal will be arranged to accommodate the Dornier-Wal flying boats which are to be used.

P. A. T. Adds Passenger Planes

SEATTLE (WASH.) — The present combined air mail-passenger service connecting Portland, Ore, and Tacoma and Seattle Wash, operated by Pacific Air Transport, is to be augmented at once by additional service for passengers only. The one round trip daily probably will be doubled later.

Radio Equipment Rules Drawn Up

WASHINGTON (D.C.)—A draft of proposed regulations under which large aircraft carrying passengers in this country would be required to carry radio facilities has been drawn up by the airways division of the Aeronautics Branch for consideration by the large transport operators. They are to be discussed by all interests at a forthcoming conference.

The suggested rules provide that a plane carrying not more than six be equipped with a radio telephone receiver and that a larger machine would have in addition, a radio telegraph or radio telephone transmitter, powerful enough to establish communication with the nearest ground station at all times Radio operators would be required to possess at least 20 hours flying experience in addition to their radio experience

Plan Pittsburgh-N. Y. Line

NEW YORK (N Y)—Following the purchase of a 600 acre air terminal site at Pittsburgh, Pa. it has been announced that a three-hour air passenger service between that city and here is being developed Tri-engined machines will be used. Probably Roosevelt Field will be the New York terminal The expected opening date for the line was not disclosed in the announcement

U. S. Airways Total 21,392 Miles

WASHINGTON (D.C.) — Airways of this country now extend over 21,392 miles, reports the Aeronautics Branch as of March 30 Transport companies operating over these airways are flying about 57 516 miles a day The nine foreign airways operated by American interests total 4 442 miles of the airways Air mail services account for 39,216 miles of the daily flying and passenger services for 18,300

Coast-to-Coast Night Mail May 1

One New Feeder Line and Extra Services Planned

WASHINGTON (D.C.) — The new night transcontinental air mail service which will cut about twelve hours off the present schedule from coast to coast will go into effect May 1 Mail will then leave New York City and San Francisco simultaneously at 8 p m, and arrive in San Francisco at 4 30 a.m., the second morning and at New York at 6 43 a m., the second morning. Eastbound mail will leave Los Angeles at 7 p m, arriving at New York at 6 43 a m on the second morning via Salt Lake City, while the westbound mail will arrive in Los Angeles at 4 15 a.m. on the second morning out of New York City

The present transcontinental will be continued giving double service on this trunk air line Several changes and additional operations on connecting services are involved. Double daily service will be operated on the Salt Lake City-Los Angeles; Salt Lake City-Pocatello, Idaho Cleveland-Pittsburgh and Cleveland-Buffalo lines

Colonial Schedule Changes

Colonial Western Airways planes westbound from Albany will leave there under the new arrangement, at 3 40 p m, instead of 10 a.m., connecting at Cleveland with the night transcontinental from New York. Colonial planes eastbound from Cleveland will pick-up the night transcontinental mail and reach Albany at 8 10 a m. The extra service being added means that planes will leave Buffalo westbound at 10 30 a.m., and Cleveland eastbound at 12 20 p m

The present service on the Cleveland Pittsburgh route will be continued and the additional service provides for planes to leave Cleveland at 12 15 a m daily and leave Pittsburgh at 12 midnight, daily On the Salt Lake City-Great Falls route planes will leave Great Falls six hours later than at present and leave Salt Lake City for the north four hours earlier. The new route being established on May 1 is between Omaha and St Louis via Kansas City, a distance of 403 miles This will be synchronized with the night transcontinental service placing St Louis within 24 hours of Los Angeles and San Francisco

The last beacon on the new San Francisco-Salt Lake City chain was lighted at sunset January 29 marking the completion of 103 days of intensive work through extremes of weather.

Airport Building Projects Reported

Many Structures Included in Activity

The City of Atlanta, Ga., on April 6 bought Candler Field for $94,500. The city has operated the 300-acre field for four years as a municipal airport under a five-year option. This option is being exercised a year in advance in order to carry on improvements which Pitcairn Aviation, Inc., says are necessary before building a large hangar and station for passenger service with tri-engine planes. A $2,000,000 improvement program has been proposed for Mills Field, San Francisco, following assertions that the field is not properly developed for all-round flying operations. Impetus to the movement was given by the Lindbergh incident in which his plane became mired.

Work is expected to start very soon on the dredging and filling for the new Secaucus Airport in New Jersey which the New York Air Terminal, Inc., is sponsoring. More than 6,000,000 cu.yd. of clay will be used to fill in the 900-acre site, some sections of which will have to be raised about 6 ft.

Hog Island Proposed

There is considerable agitation in Philadelphia for an airport with a site on Hog Island being considered a very favorable possibility for selection for the development. Boeing Field, Seattle, is to be improved to the extent of a $250,000 expenditure on an administration building, ground improvements and a large hangar.

The sale of 120 acres to Salem, Ore., has been authorized by the state and development is to start soon. A definite air expansion policy is being urged by Milwaukee, Wis., aviation leaders with particular emphasis on the Maitland Airport and the construction of a super highway from the field to the city. In Frankfort, Ky., officials have leased an 80-acre site for its municipal airport.

The old McConnell Field at Nashville, Tenn., is to be replaced with a 200-acre airport near Murfreesboro. Construction has been started on an $836,000 bulkhead for the Baltimore, Md., Municipal Airport. Arrangements are going forward for filling in the submerged areas behind the bulkhead, about 12,000,000 cubic yards of earth being required.

There is considerable agitation in Chicago these days for airport developments, one of which is a lake front project which has received the endorsement of William P. MacCracken, Jr., of the Aeronautics Branch. The Stout concern is reported seeking a new airport location on the outskirts of Chicago as an auxiliary base. Ford Airport at Lansing, Ill., has been selected for the base of the Stout sightseeing tours over Chicago.

Air Activities, Inc., is to locate on an 825 acre tract, 30 miles west of Chicago on the St. Charles highway. About 300 acres will be used as a flying field. The concern expects to develop this as an aviation industrial center. A 60 x 170-ft. hangar and recreation building have been built. Draining system and runways are about completed.

Spokane, Wash., is spending $57,000 on improvements to its airport such as widening of runways, installation of lights and the construction of a 200 x 125-ft. hangar. Portland, Ore., is planning to build four hangars, a clay and gravel runway 2,175 ft. long and a hard surface warming up and taxiing area of about 37,000 sq.yd. Albany, Ore., has bought 135 acres for an airport.

Plan Alameda Filling

New Haven, Conn., is considering an airport that is being delayed by clash of opinion between various officials interested in the work. Bids will be opened May 1 by the United States Department of Engineering, San Francisco, for dredging and pumping silt over lands leased by the Alameda Airport, Calif. Birmingham, Ala., aviation interests are seeking to raise $15,000 for the improvement of Roberts Field. Globe, Ariz., has leased 455 acres 7 miles south of the city for a municipal airport. Tampa, Fla., will have a televox attachment for turning on the field lights automatically, it is said.

El Paso, Tex., has acquired 160 acres of land adjoining the Fort Bliss Field for an airport development. The proposed plans for the improvement and expansion of the Wold-Chamberlain Airport at Minneapolis, Minn., calls for the expenditure of $600,000 for the purchase of an additional 240 acres and other improvements.

Hangars Being Built

Among the new building projects are an 80 x 150-ft. steel hangar for Bennett Airways, Inc., Kansas City at Chanute, Kan., an elaborate 186 x 190-ft. brick, concrete and steel combination hangar, showroom, machine shop and office building for the East Coast Aircraft Sales Corporation of Boston at the East Boston Airport; a 40 x 80-ft. hangar for the Arizona Flying Service at the Van Buren Airport, Phoenix, Ariz., a hangar at Newark, N. J., Airport for the Metropolitan Air Terminals, Inc., a 130 x 175-ft. hangar at the Los Angeles Metropolitan Airport, a hangar at Tulsa Municipal Airport, Tulsa, Okla., for the Southwest Express, by the Stearman Aircraft Co., at Municipal Airport, Wichita, Kan.; a 150 x 150-ft. hangar at the Montgomery, Ala., Municipal Airport, and hangars and school buildings for the Curtiss Flying Service of Michigan on Grosse Ile, near Detroit.

Airport Dedications

The following airport dedications have been announced: April 6, Pasco, Wash., Municipal Airport; April 26, 27 and 28, an airport owned and operated by the American Legion at Tracy, Calif.; in July the Savannah, Ga., Municipal Airport.

Many to Attend Airport Convention

NEW YORK (N. Y.)—About 1,000 persons interested in airport problems in a professional and official way are expected by the Aeronautical Chamber of Commerce to attend its first airport convention at Cleveland, May 15, 16, 17 and 18, under the auspices of its Airport Division.

Speakers at the first day's luncheon at the Cleveland Hotel include Maj. John Berry, manager of the Cleveland Municipal Airport, Col. H. H. Blee, Chief of the Division of Airports and Aeronautical Information of the Aeronautics Branch and Capt. Clarence M. Knox, vice president of the Aeronautical Chamber in charge of its Airport Section.

William P. MacCracken, Jr., will speak at the banquet on May 16 at the Cleveland Hotel.

Other speakers and their subjects during the three days' sessions are as follows:

Maj. John Berry, "Development, Operation and Management of the Cleveland Airport"; Gavin Hadden, "Airport Planning"; Francis Keally, Columbia University, "Architectural Treatment of Airport Buildings"; C. R. Stevenson, Management Engineer, "Scientific Management and Modern Business Methods for Airports"; W. R. Gregg, Department of Agriculture, "Weather Service Essential to Safe and Effective Operation of Airports"; F. C. Hingsburg, Chief Engineer, Airways Division, Department of Commerce, "Field Lighting, Radio and Inter-Field Communication"; E. K. Smith, Portland Cement Association, "Permanent Improvement for Airports"; W. E. Rosengarten, Asphalt Association, "Airport Paving"; Prof. H. J. Freeman, Aeronautical Chamber of Commerce, "Legal Aspects of Airport Establishment and Operation"; George E. Martin, Consulting Engineer of Barrett & Company, "Economic Traffic Facilities for Airports"; F. H. Frankland, American Institute of Steel Construction, "Permanent Airport Structures"; Wendell P. Miller, Drainage Engineer, "Soil Drainage and Its Effect on Airport Safety."

Seek Omaha-Minneapolis Line

OMAHA (NEB.)—A petition has been sent to Postmaster General W. F. Brown from business and civic interests of this city requesting an early establishment of a new airmail route between Omaha and Minneapolis, describing the route as "one of the most important in the Middle West." The route would serve Omaha, Sioux City, Sioux Falls, Mankato, Minn., which is now a center of mail distribution, St. Paul and Minneapolis. A suggested schedule calls for northbound departure from Omaha at 3 a. m. arriving in St. Paul at 7:05 a. m. and Minneapolis at 7:25 a. m., southbound departure from Minneapolis at 7 p. m. and St. Paul at 7:20 p. m., arriving in Omaha at 11:30 p. m.

Colonial Arranges For Opening Service

NEW YORK (N. Y.)—On Sunday, April 14, Colonial Air Transport Company will operate two round trip flights over its route between this city and Boston carrying a number of guests in Ford transports, as a preliminary to the inauguration of its regular passenger service between the two cities the next day, April 15. General John F. O'Ryan, president of the Colonial System will be host on the plane leaving New York and Gov. John W. Trumbull of Connecticut will be host on the plane which leaves Boston for the flight.

Bus terminals for the new passenger service have been located at the Hotel Pennsylvania in New York City and at the Hotel Statler in Boston. Buses will leave the Boston terminal at 9:15 a.m. and 3:45 p.m. on weekdays and 3:45 p.m. on Sundays, making stops at the Parker House and the South Ferry en route to the airport. New York buses will leave the terminal at 9:15 a.m. and 4:15 p.m. on weekdays and 3:45 p.m. on Sundays, with stops at the entrance to the Holland Tunnel. The buses will also meet incoming planes to transport passengers into the city.

New Weather Report System

WASHINGTON (D. C.)—Inauguration of a system of aviation weather forecasting which is intended to simplify methods, speed up dissemination of forecasts and render them of greater value to aviators was put into effect by the Weather Bureau April 1. Forecasts of weather conditions and of wind at surface and at various levels aloft are issued twice daily and cover a period of twelve hours each, beginning at noon and midnight. The country has been divided into fourteen forecast zones and forecasts are issued from five central control points as follows: Washington, zones, 1, 2, 3 and 5; Chicago zones 4, 7 and 8; New Orleans, zones, 6 and 9; Denver, zones, 10 and 11, and San Francisco, zones, 12, 13 and 14.

Boeing Radio Ready Soon

SEATTLE, (WASH.)—It is expected that the eleven radiophone ground stations in seven states along the trans-continental served by Boeing and complete plane equipment will be installed this summer before the contemplated inauguration of the passenger service over the route. Both planes and stations will be able to send and receive up to about 200 miles and planes may communicate with each other up to about 175 miles. Boeing engineers state. The system will be tied in with the Government radio beacon service.

Curtiss Field Loses Name

CURTISS FIELD (L. I.)—This flying field which has been famous as a center of flying activities since 1908 has lost its identity as Curtiss Field, having been merged with Roosevelt Field adjoining by the Wall Street owners.

Universal Adds To Ticket Forms

CHICAGO (ILL.)—Increase in the number of cities served by the Universal Air Lines has caused the ticket forms used by the concern to be increased from four to 59 in recent months. Larger ticket cabinets at its various ticket agencies have been necessitated also. The increase in number of air-rail connections being arranged are credited with being the chief cause for these changes.

Forms Eastern Express Line

NEW YORK (N. Y.)—Eastern Air Express, Inc., has been organized here to operate mail, passenger and freight services between Holmes Airport, Jackson Heights, L. I., and Philadelphia, Washington, Richmond and other points along the Atlantic seaboard. Ford transports will be used, according to the report and Clarence D. Chamberlin will serve as advisor in connection with the operations.

Keys Interests Get Radio Stations

NEW YORK (N. Y.)—Long wave radio station WRNY and the short wave station W2XAL, located at the Hotel Roosevelt here and formerly operated by the Experimenter Publishing Company, have passed into the control of the aviation interests represented by C. M. Keys, president of the Curtiss Aeroplane & Motor Company and a leader in several transport and operating concerns.

Mr. Keys says that the short wave station W2XAL will be used for weather and general information broadcasts between this city and the units of the Curtiss Flying Service chain throughout the country. Telegraph lines will be used in conjunction with this information service. The long wave station has been used by its former operators for communications with South America. There are no definite plans for its use in the aeronautical field, says Mr. Keys, but it probably will continue for a while as a regular commercial station.

To Beautify Texas Ports

DALLAS (TEX.)—Plans for the beautification of several airports in Texas have been disclosed by A. P. Barrett, president of the Southern Air Transport. Extensive landscape gardening on areas not used by the flying operations will be carried out to make the airports more attractive and popular. The arrangements will make the area attractive from the air also.

S. A. F. E. Launches Two Lines to Texas

DALLAS (TEX.)—The inaugural south and northbound flights on Erle P. Halliburton's Southwest Air Fast Express line were made April 3. The line connects this city and Tulsa, Okla., where the planes branch off, one going to St. Louis with a stop at Springfield, Mo., and the other going to Kansas City, with a stop of Coffeyville, Kan. Between here and Tulsa there are stops at Fort Worth and Oklahoma City.

Sometime this month an express service stopping only at Tulsa will be placed in operation between Dallas and St. Louis where it will connect with the Universal line to Chicago, according to Bob Cantwell, chief pilot. Frank Hoover and Tom Park piloted the north and southbound machines, respectively, on the opening day.

Ford tri-engined planes powered with Wasps are being used exclusively. The northbound schedule is: leave Dallas 8:30 a.m., leave Forth Worth 9 a.m., leave Oklahoma City 10:30 a.m. leave Tulsa 12:05 p.m.; leave Coffeyville 1:15 p.m. arrive Kansas City 3 p.m., leave Springfield at 2:55 p.m. and arrive in St. Louis at 4:55 p.m.

Southbound the schedule is: leave St. Louis at 8:30 a.m., leave Springfield 10:20 a.m.; leave Kansas City 9 a.m.; leave Coffeyville 10:35 a.m. leave Tulsa 11:30 a.m.; leave Oklahoma City 2:10 p.m.; leave Forth Worth 4:30 p.m. and arrive Dallas at 4:50 p.m.

N. Y. Port Group Organizes

NEW YORK (N. Y.)—Peter J. Brady, president of the Federation Bank and Trust Company, has been elected permanent chairman of the committee of 25 recently selected by Mayor James Walker to handle the city's problems on airports and aviation. Other members of the committee are: Assistant Mayor Charles F. Kerrigan, Arthur S. Tuttle, Commissioner Cosgrove, Clarence D. Chamberlin, William J. Pedrick, S. C. Mead, John J. Duffy, Frank A. Tichenor, United States Senator Robert F. Wagner, Maj. John Dwight Sullivan, Representative Loring M. Black, Jr., W. J. L. Banham, Harry F. Guggenheim, George F. Trommer, Ralph Jonas, Generoso Pope, Frederick B. Rentschler, Dr. G. E. Sevfarth, Otto J. Kalt, Emil Witzel, Frank L. Polk, Fred C. Lennierman, Jesse I. Straus, H. E. Eckhoff.

Buhl Buys Airport

DETROIT (MICH.)—The Buhl Aircraft Company, Marysville, Mich., has purchased a square mile of land adjacent to the St. Clair River, one mile south of St. Clair, Mich., for a company airport. Development began April 1 and the field is expected to be ready for use by June 1. Following completion of a 150x90 ft. hangar the company will construct a large assembly plant to supplement its plant already operating at Marysville.

FOREIGN ACTIVITIES

Inventor Explains "Helicogyre" Machine

LONDON (ENGLAND) — Signor V. Isacco, inventor of the "Helicogyre," recently described his airplane before the Royal Aeronautical Society here. A machine of this type is being built at the works of S. E. Saunders under encouragement of the Air Ministry.

The plane being built by Saunders consists of four revolving wings with four Bristol Cherubs fitted to each wing tip and an Armstrong-Siddeley Genet in the nose of the fuselage. The machine differs from the Autogiro in that the wings are propelled by the engines placed in the wing tips. The engines are placed there in order to secure best propeller efficiency. Each engine has its own gasoline and oil tanks inside the wing to which it is attached. Ailerons extend along almost the entire trailing edge of each wing, acting as elevators.

The inventor claims that in case of failure of one wing engine the others would be sufficient to keep the planes rotating. In case all engines should fail, the nose engine would propel the machine in the same fashion as the better known Autogiro. Signor Isacco expects that some form of jet propulsion will replace the engines in the future.

It was stated that the first machine built on this principle, produced by the French Government, lifted 1,875 lb with 100 hp developed by two wing engines of 50 hp each placed in the middle of the wings. Another machine, which had two wings each fitted with a Bristol Cherub, was said to have weighed 1,320 lb and got into the air using only 50 hp. According to the lecturer, 30 lb per hp may be lifted with four wings of improved design, each having an engine.

London-Cape Plans Progress

LONDON (ENGLAND) — Probably the latest stumbling block to the development of the country's air line to Cape Town has been the failure of the South African Government to pay its share of the subsidy necessary to launch the enterprise. With the practical agreement of the South African officials to subscribe to this scheme, however, there appears to remain only the work of organization before launching the line. This technical work will require, however, several months.

French Plan Line to Beirut

PARIS (FRANCE)—The Oriental division of the French Air Union will start next month a weekly flying boat service between a point near Marseilles and Beirut in the Near East.

Foreign News Briefs

Captain G. Lepere, a member of the French Mission to this country in 1917, and designer at McCook Field, of a two-seat reconnaissance and fighter biplane built around the Liberty, is a member of the Lepere-Weymann Company, recently formed in France. This concern has acquired license to construct the Cierva Autogiro in France. Mr. Weymann won the 1911 Gordon Bennett Race in England on a French Nieuport monoplane as an American contestant.

Junkers has confirmed the report that it is extending its four lines between Teheran-Kasr-I-shirin to Baghdad this month, where it connects with the new English London-Karachi service.

Scadta, veteran Colombian company, has received another set back in its expansion plans. This time it is at the hands of the Peruvian government which has refused permission for the concern to operate in that country on the ground that two other concerns, Pan American-Grace Airways and Faucett Aviation Company, already are in service there.

"Lot," the Polish government air transport company, has replaced its equipment on the Warsaw-Posen Line, with new Fokker machines. On its other lines which have been operated with Junkers machines since 1922 with excellent efficiency there will be no change in equipment.

No passengers are to be carried on the first flights of the new British airships across the Atlantic. Note!

One of the racing seaplanes being used for training English pilots for the forthcoming Schneider Cup races recently was looped successfully at high speed, it has been disclosed.

On its tenth year of operation the French Air Union is inaugurating April 8, its de luxe twice daily service between London and Paris using its finest and fastest machines called the Golden Rays, all-metal biplanes powered with two Renault geared engines developing a total of 1,000 hp.

English Plan Altitude Attempt

LONDON (ENGLAND)—Reports are current here that secret preparations are being made for an attempt to reach an altitude of 8 miles in a specially built all-metal plane. The engine, according to reports, will be enclosed in the fuselage and will be heated by its own exhaust. Further interest is attached to the effort by the reports that France is planning a similar attempt.

Dutch Busy in Far East

BATAVIA (DUTCH EAST INDIES) — Service provided by the two air lines started here in November 1928, one to Bandoeng and the other to Semarang, have been extremely popular. Almost 550 passengers were carried by the former line in November and 557 in December while 121 passengers were carried on the latter in November and 145 in December. There has been considerable "joy hopping" in addition. The next venture will be the development of a line from here to Singapore and Medan. Fokker planes with Armstrong-Siddeley engines are used.

Italy produced in 1928 400 military planes and 75 school and civilian planes for which about 900 engines were required, according to the Department of Commerce.

Air mail service between Moncton, N. B., and Prince Edward Islands was cancelled March 30 on account of unsafe landing fields after a successful winter operation.

A Cierva Autogyro was flown from Paris to Proyes a distance of about 86 miles recently in one hour. The machine carrying three persons, left the ground after a run of 20 ft. and rolled only a few feet after landing.

Japan inaugurated its first air mail April 1, between Tokyo and Korea.

What is said to be a distance record for a glider has been recorded in Germany with a flight of 24 miles.

The railways of Mexico have arranged with the aviation companies operating in that country to carry air express beginning May 1.

A hydrogen plant has been established at the St. Hubert Airport, Montreal, to service the English dirigible R-100 when it visits the Dominion next summer.

Sabena, the Belgian air transport company, reports that its plane flew 12,427 miles and carried 104 passengers and 4,232 lb. of mail on its Belgian Congo line in December. A new line in the Congo 311 miles long, was started in January.

Women seeking commercial pilot licenses in Canada must measure up to the same physical requirements as men according to a recent decision of the Canadian Department of National Defense.

THE BUYER'S LOG BOOK

Hangar Door Rollers

INCLUDED in the hangar door hardware manufactured by the Allith-Prouty Co., Danville, Ill., is the Allith "Seventy-Fifty" (No. 7050) Bottom Roller which has an eleven-inch malleable iron wheel deeply grooved to run on 12 lb. industrial rail so that it will not climb or jump the track. The axle is assembled with a roller bearing to assure permanent free rolling, and lubrication is obtained through an Alemite fitting. Side plates are of boiler plate steel made in a large size to properly reinforce the door and through bolts are used for attaching to the door of the hangar or building.

The No. 7062 Roller

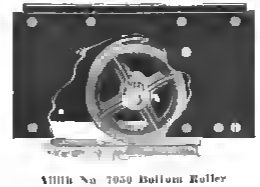
The "Seventy-Fifty" is an exceptionally substantial bottom roller and may be depended upon to perform in a highly satisfactory manner on doors where the weight on each roller is less than 2,000 lb.

The Allith "Seventy-Fifty-Five" (No. 7055) Top Guide Roller is furnished with a three-inch roller bearing wheel, assembled on a door plate made to conform with the requirements of the job.

In a number of cases where the steel frame doors have already been made, these bottom rollers have been furnished with special side plates so designed as to allow application beyond sides of doors yet secured to and through the corner gussets. Blueprint data of this special work can be furnished by the company upon request.

Top roller position is maintained through the use of angle iron guides that are spaced and attached to the head construction in such a way as to allow for the travel of the guide wheel.

Three other types of bottom rollers for use with 12 lb. industrial rail are included and designated numbers 7080, 7062 and 7070. The selection of any one of these types of rollers is determined by the door construction and the placing of the doors in relationship to the head construction.



Allith No. 7050 Bottom Roller

However, No. 7062 performs very well on either metal or wood doors and its use is recommended as it does not require the cutting out of any portion of the lower door rail.

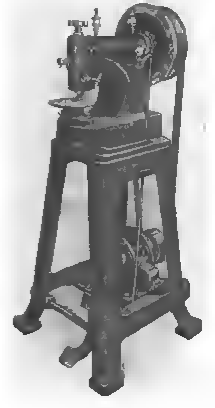
Wheels of all three types are 8 in. in diameter on the tread. Timken roller bearings are used in these wheels to assure permanent easy rolling action. Nos. 7070 and 7080 have Strom hall bearings on pivot shaft, while No. 7062 is fitted with a Timken roller bearing at this point. Alemite fittings are used for pressure greasing of Timken bearings. Top guide rollers are usually made specially, so as to fit the type of door used and also to match up with the overhead construction.

Top wheel guides usually supplied by the metal fabricating contractor, may be either channels or angles.

Nibbling Machine

ONE of the automatic devices which is being used extensively in aircraft factories is the nibbling machine manufactured by Andrew C. Campbell, Inc., Bridgeport, Conn. In many cases the use of this machine eliminates the expense required for stamping dies necessary to make small parts and fittings from sheet stock.

This machine is very simple in its operation and consists simply of a circular die above which a cutting punch operates at high speed and cuts metals or composition sheets along an inscribed line or to a template.



The Campbell Nibbling Machine

One particular feature of the Campbell nibbling machine is the fact that the cutting operation does not distort the material being cut and therefore does not start invisible fractures which might result in a complete failure of the part at some later time.

These machines are now being adopted by many manufacturers and result in saving of labor and costs. Full particulars regarding the machine can be secured from the company.

Bonney Wrench Set

ANNOUNCEMENT was made recently by the Bonney Forge & Tool Works, Allentown, Pa., of the addition to its line of a new set of double-end box wrenches. This set which is designated No. 33 contains nine wrenches with openings from 7/16 to 15/16 in. together with a metal carrying case.

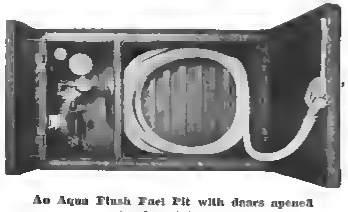
These wrenches are designed with a double hexagon opening allowing secure gripping of nuts with very little hand movement. It requires but a twelfth turn of the handle to remove a nut. These wrenches are strong, light in weight and valuable for close work.

Aqua Flush Fuel Pit

INCLUDED in the fueling equipment manufactured by Aqua Air Service, Inc., 2 Lafayette Street, New York, N. Y., is a fueling pit which can be mounted flush in the field. This pit is of heavy steel welded construction and water-tight.

The Aqua fuel pit has two compartments, one to contain the hose and the other for the motor. The hose compartment accommodates 75 ft. of 1¼ in. triplex hose fitted with a self closing nozzle. It is locked to the underside of the cover for greatest facility and speed in the fueling operation.

The meter compartment is equipped with a continuous flow positive displacement meter and a large circular dial which is easily read even for fractions of a gallon



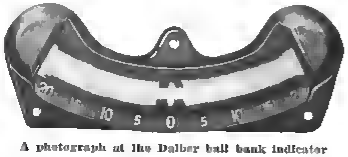
An Aqua Flush Fuel Pit with doors opened to show interior

of gasoline. Each individual fueling operation and the totals over a given period is recorded. In the meter compartment is a control valve interlocked with remote control switch. When the control valve is turned on manually the remote control switch automatically turns on. This control valve can be shut off manually but, should operator neglect to turn it off, closing of the cover automatically turns off the fuel supply and shuts off the entire system.

The Aqua flush fueling pit provides service at a rate of 20 or more gallons per minute continuous flow and is simple and foolproof.

Daiber Ball Bank Indicator

A BALL bank indicator that can easily be installed in an airplane is offered by Emil Daiber, 3255 West 86th St., Cleveland, O. A number of other aircraft instruments also are manufactured by this company. The



A photograph of the Daiber ball bank indicator

Daiber ball bank indicator is furnished as standard equipment on a number of commercial planes, weighs 3 oz. and can be furnished with luminous and non-luminous markings. The instrument occupies a space 5½x2¼ in. on the panel.

SIDE SLIPS

By Robert R. Osborn

A new type of airplane safety seat was demonstrated in New Jersey recently. The pilot of the ship had a control by means of which he could drop the passenger in this seat through the bottom of the ship and land him safely with a parachute which opened automatically as soon as the falling passenger was clear of the ship.

We'll bet the inventor of that device has a mother-in-law whose specialty is back-seat driving while automobiling.

* * *

Our campaign against under-water flying fields, which we undertook after our visit to the National Air Races in Philadelphia in 1926, doesn't seem to be making much headway. Not very long ago there were some news dispatches from Philadelphia stating that there was some discussion among the good citizens of that city as to the merits of their municipal airport, about half of it, apparently, being under water. Then came the headline "Camden Launches Airport" showing that the city just across the Delaware from Philadelphia has some ideas along the same lines also. Next we read that the mail planes were refusing to land at the Newark Airport because of the depth of the mud covering that field. Later came the news that a large corporation had decided that the swamps in the meadows near Secaucus, N. J. would be an excellent place for a new airport. Today we read in our daily paper that the New York Mayor's Committee on Airports had made the Department of Docks its headquarters.

There seemed to be great editorial surprise in the papers recently when Sir Hubert Wilkins returned from an airplane exploration of the south polar regions with the suggestion that the north polar regions be explored by submarine. Judging by our enthusiasm for submerged airports Sir Hubert's activities might not be so surprising as one might think from first reading.

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"PLANE WITH BABY IS SAFE IN INDIANA"—*Headline, N. Y. Post.* Both doing well, we hope.

* * *

According to the news, a famous American publisher, who is making an extensive aerial tour of Europe, experienced a forced landing the other day because of a "mishap" to one engine on his plane. At the bottom of the account we read was a little note showing just what the mishap was:—"A valve broke and a piston cracked, fragments were forced into the crankcase and a cylinder had dropped off, the engine finally disintegrating almost entirely with the parts dropping off into space."

We're glad it was only a "mishap," and nothing serious that happened to the motor, but one can't be too careful these days and our opinion is that it might be in need of a major overhauling after all.

Who *pays* the fiddler when sightseers *play tag* with a plane

WHEN sightseers race out on the field after a plane, the Grim Reaper may join in the chase. If old G.R. catches Mr. Sightseer . . . who pays for the game of tag?

Mr. Sightseer? Yes, and the owner of the plane, or of the airport may also have to contribute . . . a damage suit costs money.

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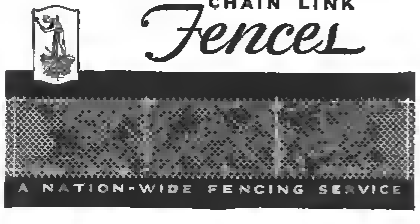

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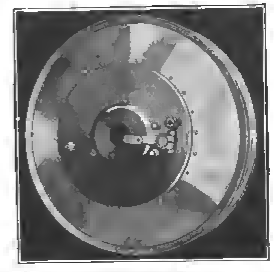

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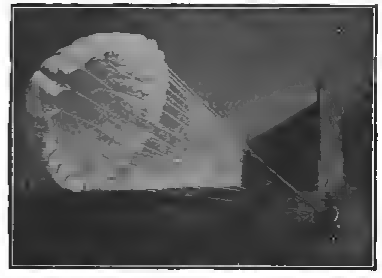

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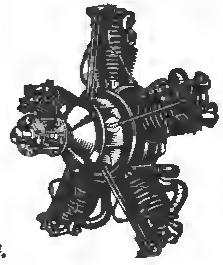

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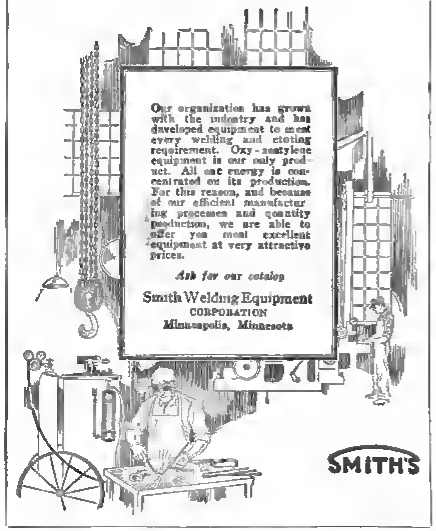

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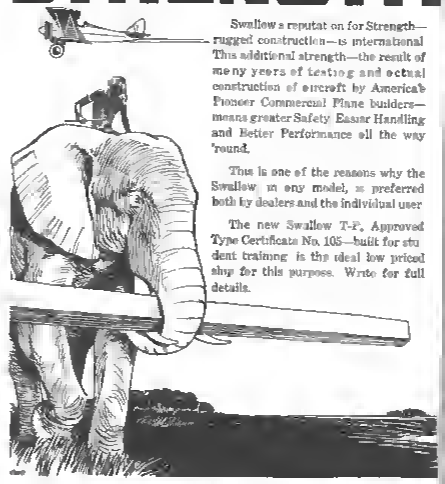

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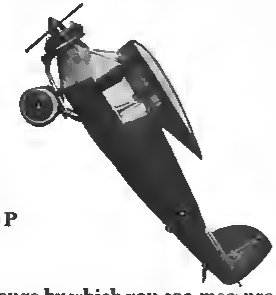

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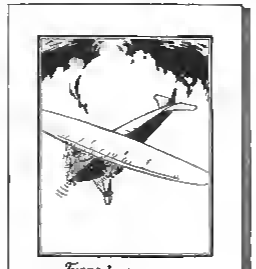

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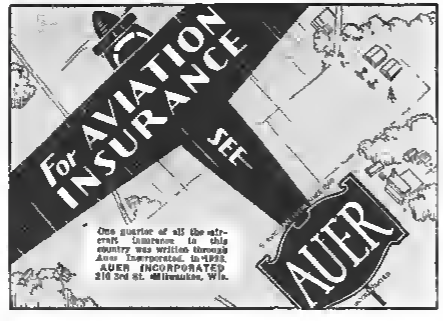

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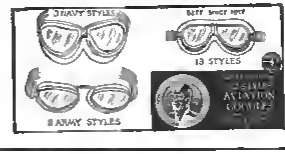

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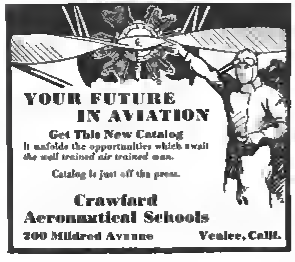

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Of Aviation, published weekly at New York, N. Y., for Apr. 1, 1929.

State of New York } ss.
County of New York }

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